DAIRYING

Instructional-cum-Practical Manual

DAIRY ANIMAL MANAGEMENT

Volume I

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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Volume I

DAIRY ANIMAL MANAGEMENT

DR A.K. SACHETI
Project Coordinator

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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Foreword

The programme of vocationalization of higher secondary education has been accepted by the country as it holds forth great promise for linking education with the productivity and economic development of the country, by providing education for better employability of the youth.

In view of the importance of the programme, the NCERT is making an all-out effort to provide academic support to the implementing agencies in the States. One of the major contributions of the NCERT is in the field of curriculum development and in the development of model instructional materials. The materials are developed through workshops in which experts, subject specialists, employers' representatives, curriculum framers and teachers of the vocational courses are involved. These materials are then sent for try-out in schools and feedback is collected through questionnaires and also through direct contact. The materials are also sent to experts for comments before they are published.

The present manual on DAIRY ANIMAL MANAGEMENT has been developed in the manner described above and is meant for the students studying Dairying and allied vocations. It is being published for wider dissemination amongst students and teachers throughout the country. I hope that they will find the manual useful.

I am grateful to all those who have contributed to the development of this manual. I must acknowledge also the immense interest taken by prof. A.K. Mishra, Head, Department of Vocationalization of Education in inspiring his colleagues in their endeavours to develop instructional materials. Dr. A.K.Sacheti, Reader, functioned as the Project Coordinator for the development of this title in association with Dr. A.K. Dhote, Lecturer. They have my appreciation and thanks for planning, designing and conducting the workshops and for technical editing.

Suggestions for improvement of this manual will be welcome.

P.L. MALHOTRA
Director
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New Delhi

Preface

Ever since the introduction of vocationalization in the school system by several States and Union Territories in our country, the paucity of appropriate instructional materials has been felt as one of the major constraints in implementation of the programme and a source of great hardship to pupils offering vocational studies at the higher secondary stage.

The Department of Vocationalization of Education of the National Council of Educational Research and Training, New Delhi has started a modest programme of developing instructional materials of diverse types to fill this void in all major areas of vocational education. The task is too gigantic to be completed by any single agency but the model materials being developed by us might provide guidance and impetus to the authors and agencies desiring to contribute in this area. These are based on the national guidelines developed by a Working Group of experts constituted by the NCERT.

The present manual is on DAIRY ANIMAL MANAGEMENT and is meant for the pupils and the teachers teaching Dairying and allied vocations being offered in a number of States. It contains activities (Practical exercises) to be performed by pupils, with simple steps to follow, precautions to be taken and data to be obtained and processed. Each activity is complete with objectives, relevant information, behavioural outcomes, evaluation, etc. It is hoped that the users will find them immensely useful.

The manual was developed by a group of experts as contributors in a workshop held at the College of Animal Sciences, Haryana Agricultural University, Hissar, Haryana.

The names of the experts are mentioned elsewhere and their contributions are admirably acknowledged. Dr. A.K. Sacheti, Reader and Coordinator of this project and Dr. A.K. Dhote, Lecturer, Department of Vocationalization of Education deserve special thanks for editing and bringing the manual in the present form. The assistance of all in the College of Animal Sciences, Haryana Agricultural University, Hissar, Haryana, and the Department of Vocationalization of Education, NCERT, New Delhi is also gratefully acknowledged.

ARUN K.MISHRA
Professor and Head
Department of Vocationalization of Education

New Delhi

GANDHIJI'S TALISMAN

"I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test :

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it ? Will it restore him to a control over his own life and destiny ? In other words, will it lead to Swaraj for the hungry and spiritually starving millions ?

Then you will find your doubts and your self melting away."

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Dr. N.S.R. Sastry, Dr. S.G. Rotte, Dr. S.V. Pachalag,
Dr. M.P. Singh, Dr. R.S. Yadav, Dr. D.K. Bidarkar,
Dr. A.K. Dhote and Dr. A.K. Sacheti.

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Introduction

In ancient times there was no shortage of milk in India. The cow was worshipped for her immense use to mankind. She bestows man with her milk, manure and draft power. The utility of a cow goes on even after her death, in the form of skin, bones, hooves and horns.

During the decades of the transformation of socio-economic modalities, the status of the cow changed. The old tradition of worshipping cows slowly disappeared. Man and society are now interested only in getting a bottleful of milk daily, without knowing who produces the milk, how it is produced, what are the raw-materials used, how bottling is done, how much manual labour is consummed and so on. Suffice to say that millions of cows and buffaloes produce this milk and millions of small producers are involved in this arduous task every hour, every day, every year.

India has about 182 million cattle and 61 million buffaloes. Most of them are located in the rural sector. Obviously, they have to be in the rural sector for efficient production.

The farmers maintain the cows and buffaloes. The typical characteristic of farming in our country is the mixed system of farming which is based on a strong interrelationship between livestock and crop farming. A symbiotic relationship exists between livestock and crop farming. Among the very many causes for this, the most important one is the constant fragmentation of land due to the laws of inheritance. The large number of small farms in our country face certain limitations in terms of economic viability and therefore resort to some alternative avocation which can substitute and support the family during hard times. Dairying is one of the enterprises which comes to the rescue. It provides ample opportunities of employment for the rural masses in general and educated youths in particular.

The technical know-how in dairying will act as an effective tool and the means of livelihood for the rural educated youths. To provide the technical know-how to such a clientale a series of six instructional-cum-practical manuals have been developed for the use of vocational students wishing to take up dairying as an enterprise. The present manual on

Dairy Animal Management is one of them.

The first three Activity Units presented in the manual introduce the vocational students to the technique of handling the different categories of animals, study of their external body parts and the routine care.The subsequeent nine Activities are appropriately designed for developing skill in feeding, breeding and management. The aspects of housing, health and hygiene are covered in the last few Activity units. It is hoped that by using this manual the learner will develop the desired skills and acquire the relevant knowledge for the Management of dairy animals.

ACTIVITY UNIT 1

Approaching and Handling Dairy Animals

1.1 Instructional objectives

The pupil should be able to:

— approach dairy animals correctly;
— handle dairy animals properly;
— restrain dairy animals safely.

1.2 Relevant information

Purpose of handling

The animals have to be handled routinely for the purpos of milking, nursing, training, administration of medicines, weighing, castration, dehorning, insemination and veterinary care. The handling procedures should be such that they do not disturb or injure either the animal or the handler.

Principles of handling

Animals vary in their behaviour and temperament from highly docile to extremely ferocious. Each animals behaviour pattern has to be considered while approaching and handling it. The operator has at his command persuasion, kind behaviour, use of food as bait, use of drugs and equipment for efficient handling of animals.

1.3 Precautions

— Treat animals camly with patience and firmness.
— Never show fear, do not lose your temper or get excited.
— Always handle animals in the presence of their owner.
— Avoid risks and trying to control animals by force and cruelty.
— Before approaching at animal, choose the appropriate method of handling it.
— Avoid using a stick.

1.4 Materials required

1. Cotton rope ten 10 m long, 2-3 cm thick
2. Bull nose ring.
3. Bull pole
4. Rope halter
5. Cotton rope 1.5m long, 1 cm thick.
6. Trevis
7. Trocar and canula.

1.5 Procedure

1 Approaching cattle and buffaloes

— Have the owner or attendant looking after the animal beside you while approaching the animal.
— Before touching the animal, try to call it and speak to it whether it is in a pen or in the open.
— Approach the animal from behind and on its left (milking) side.
— Start patting and scratching the back and sides of the animal as you go nearer it.
— Handle the head and neck first.
— Do not stand beside or behind the hindlegs.

2. Handling and restraining head

(i) Puncturing the nasal septum

Puncture the nasal septum in bull calves at the age of 18 months.

— Apply a rope halter by slipping it over the mouth and securing it at the poll region.
— Ask two fellow pupils to hold the head tight on either side.
— Hold the trocar in your right hand with the canula in position.
— By inserting the thumb and forefinger of your left hand half way into the nostrils, steady the nose of the animal.
— With a sharp and sure thrust of the trocar and canula, pierce the nasal septum 1 cm away from its anterior end.
— Withdraw the trocar leaving the canula in the puncture.
— Pass a 0.5 cm thick and 1.5 m long cotton rope through the puncture, using the canula as a guide.
— Pull the rope through the puncture as the canula is withdrawn.
— Secure the rope in position by passing it behind the ears and tying a knot at the top of the head.
— Apply an antiseptic like tincture iodine to the puncture for a few days.
— Use the puncture for fixing nose ring in bulls and nose rope in bullocks.

(ii) Applying a bull nose ring

— Control the animal securely.
— Open the two halves of the bull nose ring wide by removing the firing screw.
— Pass one end of the opened ring through the puncture previously made in the nasal septum.
— Close the ring by snapping the two halves together.
— Secure the ring by tightening the screw in the hole provide for the purpose in the ring.

(iii) Use of bull pole

— Study the functioning of the bull pole.
— Stand by the left side of the neck of the bull.
— Hold the bull pole in your left hand.
— Open the ring at the end of the pole by pulling the string of the pole with your right hand which displaces the spring lever.
— Entangle the hook portion of the bull pole ring in the bull's nose ring.
— Close the ring of the pole by releasing the string that makes the spring level go back into position.
— Lead the bull safely by holding the free end of the pole.

(iv) Use of hands

— Resort to this method only when no other equipment is available for restraining cows or young animals briefly.
— Stand on the left side of the neck of the animal.
— Grasp the nearest horn with the right hand and hold firmly.
— Pass the four fingures of the left hand into the mouth of the animal from the left side in the space between the front and jaw teeth and hold firmly.
— Lift the head of the animal above the level of the back of the animal and hold in that position.

3. Handling and restraining forelegs

— Control the animal by steadying the head.
— Tie a rope (1.5 cm thick and 1.5 m long) to the cannon above the fetlock of the leg to be restrained (Fig 1.5.1).
— Pass the free end of the rope over the withers to the other side.
— Stand on the same side as the leg being restrained and let the animal lean on you as another attendant, on the other side, pulls the free end of the rope down, thus, forcing the animal to lift its leg.
— As the leg is lifted, examine the hoof or carry out any other desired operation.

FIG. 1.5.1 METHOD OF LIFTING A FORE LEG OF A COW

4. Restraining hindlegs

(i) Lifting the hindleg

— Place a strong smooth pole or solid bamboo in front of the hock of the leg to be lifted in such a way that the pole is behind the hock of the other leg. (Fig.1.5.2).
— Let two persons hold the two ends of the pole and lift the same, thus, forcing the animal to lift its leg.
— Let these persons lean againt the animal for preventing it from falling.

(ii) Preventing kicking while milking

— Procure a 1 cm thick and 1.5 m long rope- the milkman's rope.
— Pass the rope around both the hindlegs above the hocks (Fig. 1.5.3).
— Cross the free ends of the ropes between the legs.
— Finally, make a quick release knot of the free end on the milking side.
— Note that when the rope is applied correctly, it snould be in the torm of the figure '8'.

5. Casting animals

— Four pupils (4 fellow students) should be kept ready for casting.
— Keep the animal to be casted off feed for 12 hours and off water for 4 hours, as far as possible.
— Make sure that there is plenty of space for casting the animal.
— Make a noose at the end of a 10 m long rope.
— Pass the noose around the base of the two horns and tighten the same.
— Apply a fixed noose of appropriate size around the neck of the animal if it does not possess horns.
— Make one half-hitch around the neck (skip-off this hitch when the noose is fixed around the neck).
— Make a second half-hitch around the chest, just behind the forelegs.

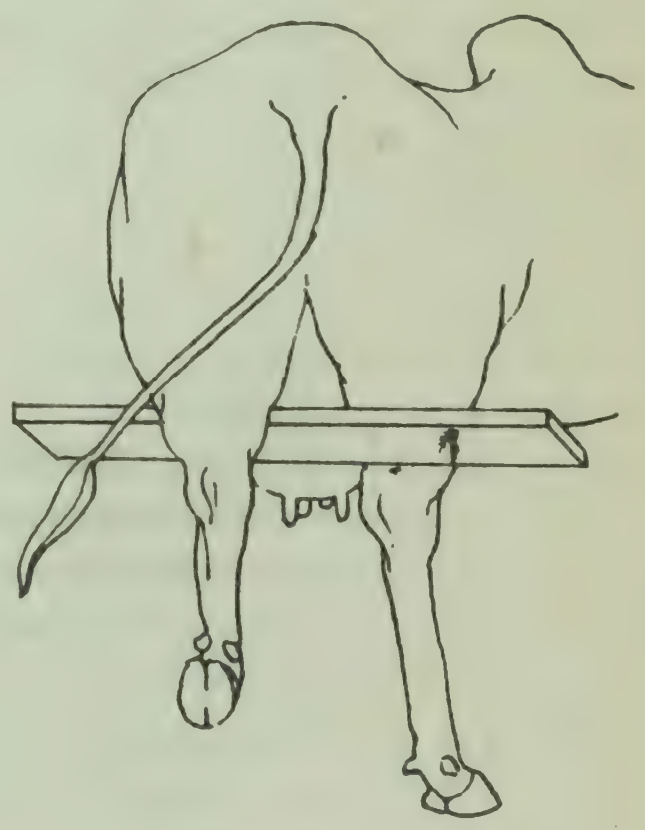


FIG. 1.5.2 METHOD OF LIFTING A HIND LEG OF A CO

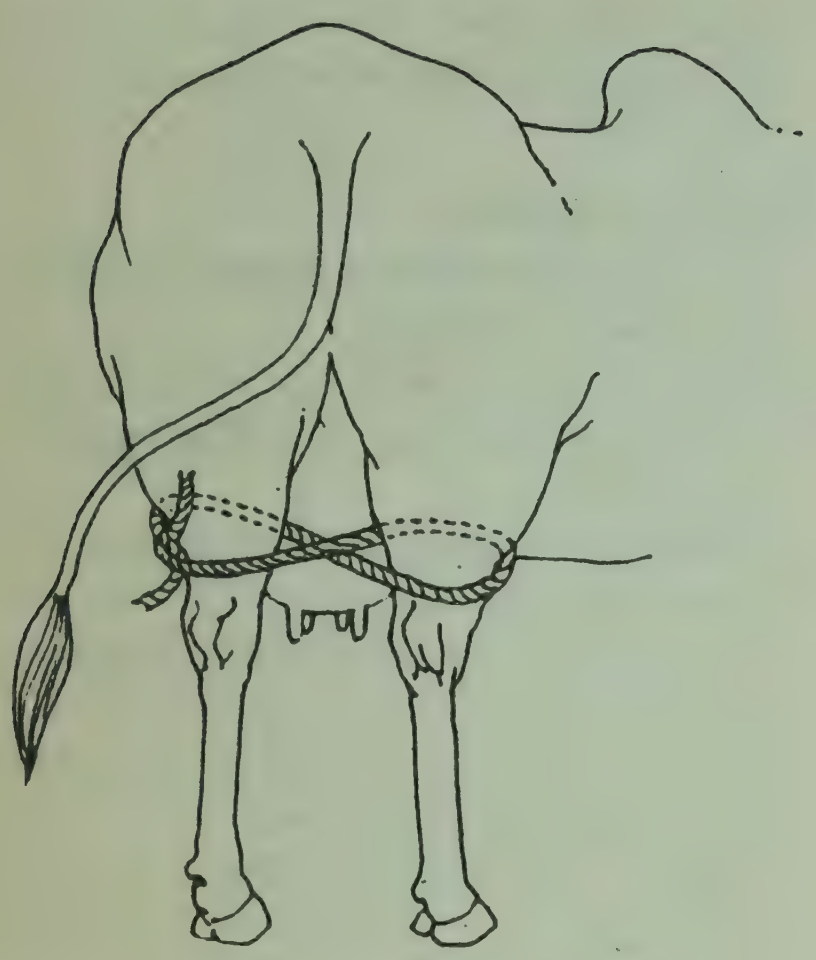


FIG. 1.5.3 A MILK-MAN'S ROPE IN POSITION

— Make a third half-hitch around the flanks, just in front of the hindlegs.
— Let one pupil hold and steady the head.
— Let one pupil stand on the casting side and support the animal as it falls.
— Let two pupils pull the free end of the long rope backwards strongly which makes the animal sink to the ground.
— See that the following activities are carried out simultaneously:
  (i) The pupil steadying the head should ensure that it does not hit the ground suddenly with force and as soon as the animal falls, extends the neck forwards and upwards and pins the head to the ground.
  (ii) The pupil standing on the casting side reduces the impact of the falling animal striking the ground and, as soon as the animal falls, keeps its rump pinned to the ground.
  (iii) Of the two pupils pulling the rope, as the animal falls, one helps in pinning the rump of the animal to the ground and the second secures the legs of the animal.
— Secure the legs of the animal in the following order:
  (i) Fix a noose made at the end of a 1.5 long and 1 cm thick rope to the lower hindleg.
  (ii) Place the two hindlegs together and using the loose end of the rope, make two half-hitches around them tightly.
  (iii) Pull the four legs together in such way that the lower front leg is below the bound hindlegs and the upper front leg is above the bound hind legs.

  Make 2 or 3 more half-hitches around the four legs together and secure the free end of the rope by means of a quick releasing knot.

6. Use of trevis or cattle crush

— Get a trevis made of wooden or metal
— As seen as the animal enters the trevis, close the entry by replacing the cross bars in position.

  bars as shown in Figure 1.4

— Open the entry of the trevis by removing the replacable cross bars.
— Lead the animal into the trevis by the halter or nose rope or neck rope.
— Goad the animal if necessary.

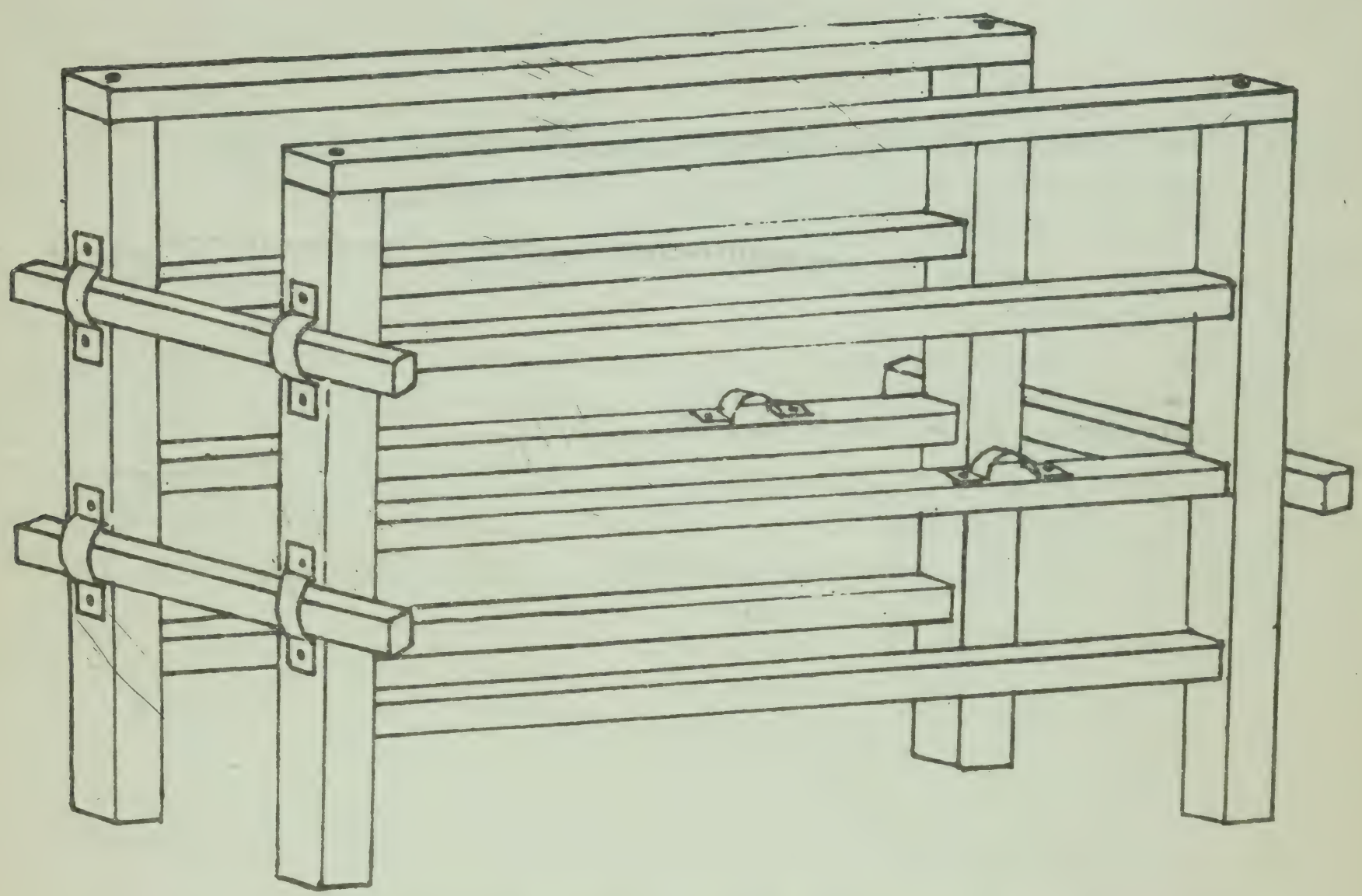


FIG. 1.4 A TREVIS OR CRUSH FOR LARGE ANIMALS

1.6 Expected behavioural outcomes

The pupil will be able to:

— approach dairy animals correctly and confidently;
— handle the animal's head and legs properly;
— organize casting of adult animals.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Fill in the blanks with the appropriate word/words

(i) The animal should not be approached from front because it may _____ (attack you/get nervous).

(ii) While the legs of animals are lifted they can be allowed to _____ (fall/lean against attendants).

(iii) By casting the animal is made to _____ to the ground (sink/fall).

(iv) Control of the head of a bull is a must as bulls are always _____ than cows (more ferocious/bigger).

(v) Two types of ropes are used while casting as it involves restraining of the body as well as _____ (legs/head).

(vi) A halter is _____ device to control the head of animals (the sole/one of the).

ACTIVITY UNIT 2

Study of the External Anatomy of Cow and Buffalo

2.1 Instructional objectives

The pupil should be able to.

— identify different body parts of animals;
— locate different body parts of animals correctly.

2.2 Relevant information

Specific terms are used by veterinarians and husbandry men in describing different body parts of animals. These terms are universal. A knowledge of such terms and the location of the external body parts of animals is necessary in describing animals precisely, judging and selecting animals on the basis of physical traits preparing veterinary certificates and legal documents, and proper understanding and application of husbandry and veterinary practices. In fact, learning about the external anatomy of dairy animals is the first step in animal management.

The external body parts of a cow are indicated in Fig. 2.2.1. A clearer explanation of more specific terms with which the pupil may not be acquainted are described below.

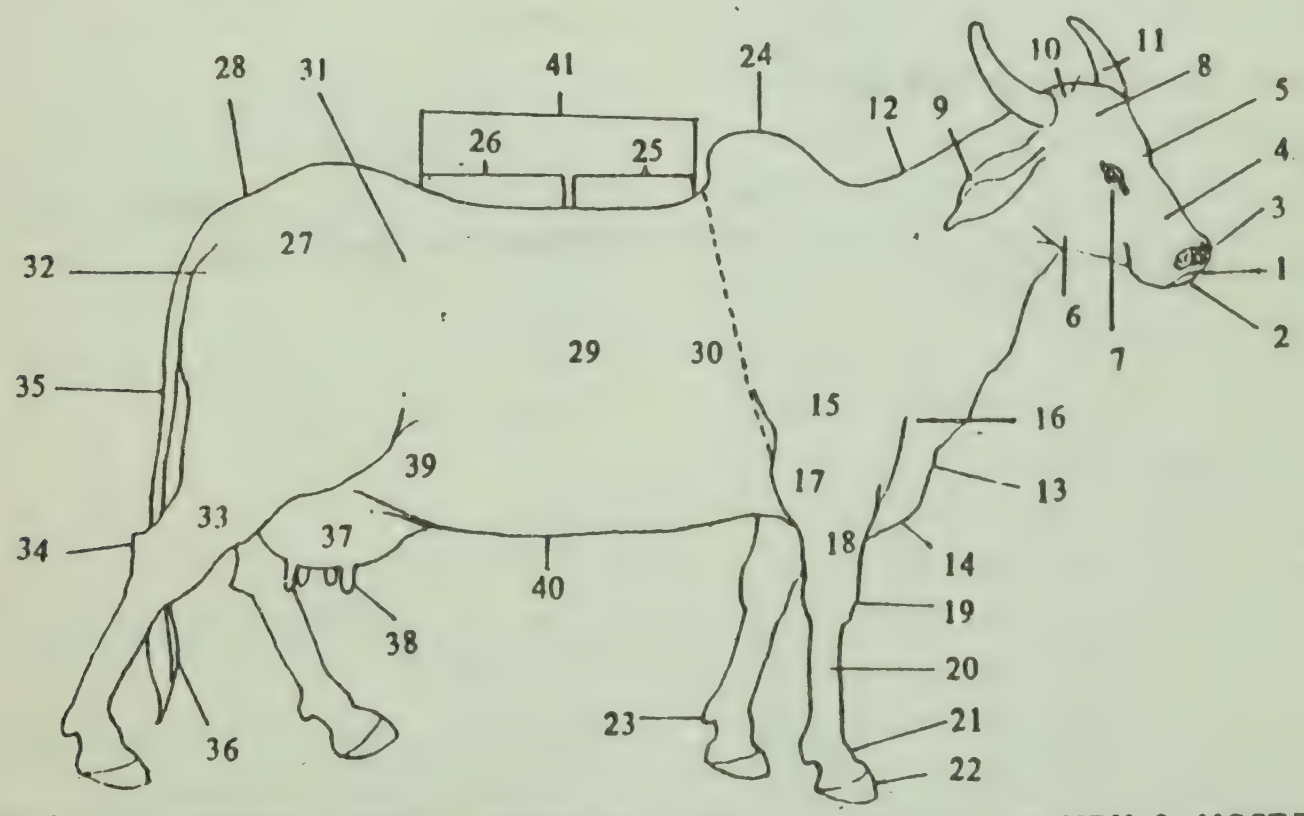


FIG. 2.2.1 EXTERNAL BODY PARTS OF COW 1. MUZZLE 2. MOUTH 3. NOSTRIL 4. NOSE BRIDGE 5. FACE 6. JAW 7. EYE 8. FOREHEAD 9. EAR 10. POLL 11. HORN 12. NECK 13. DEWLAP 14. BRISKET 15. SHOULDER 16. SHOUL--DER POINT 17. ELBOW 18. ARM 19. KNEE 20. SHANK 21. PASTERN 22. HOOF 23. DEW CLAW 24. HUMP 25. CHINE 26. LOIN 27. RUMP 28. TAIL HEAD 29 BARREL 30. HEART GIRTH 31. HIP POINT 32. PIN BONE 33. T--HIGH 34. HOCK 35. TAIL 36. SWITCH 37 UDDER 38. TEAT 39. REAR FLANK 40. NAVAL FLAP 41. BACK.

(i) Head:

muzzle-the moist black portion of the upper lip; lips; nostrils; bridge of nose; face; forehead; poll-the region between two horns; chin; jowl-the lower face of the lower jaw; cheek; parotid region-behind the angle and vertical border of the lower jaw; mandible - lower jaw.

(ii) Neck:

crest-the upper part of the neck where ligamentum nuchae is situated; throat - the lower part of the neck; wind pipe or trachea which is like a hand rubber tube in the centre of the throat; jugular groove - a groove running parallel to and above the wind pipe on either side of neck; dewlap-the large loosely hanging skin fold on the lower border of neck of cattle

(iii) Trunk:

Hump the highest part of the trunk just behind the junction between neck and trunk; back the region from behind the hump to the head of the last rib along the top line; loin- the flat region behind the back and upto the rump or CROUP region; Rump or croup region of sacrum extending from behind the loin to the tail-head including the incline of hips; clock or Tail-head; Buttocks; Belly; flank-the hollow in front of hips and stiffe; hip point-the external angle of ilium forming the top post erior angle of flank; hind quarters-area bounded by the hip point to the dock above and from stifle to upper part of thigh muscles; shoulder-the region of scapula i.e. behind neck and straight above the foreleg, shoulder point- the prominent place along the anterior border of the shoulder region; Girth-circumference around chest; brisket - the fleshy prominent mass lying between the forelimbs.

(iv) Hind limb:

Stifle - joint between femur, patella and tibia lying roughly at the junction of leg with trunk; thigh; hamstring or achilles tendon-strong tendon attached to point hock; hock- the large joint above hind cannon; hock point - the pointed structure of the hock joint on its posterior face; hind cannon-the part between hock joint and fetlock joint; fetlock joint-just above pastern; pastern - the portion of leg between fetlock and coronet; Coronet-junction between skin and hoof; hoof-consisting of two digits with interdigital space.

(v) Fore limb:

elbow-the joint at the junction of foreleg with trunk with a point on its posterior face; axilla-the region inside elbow; forearm-part of leg between elbow and knee; knee-joint between forearm and cannon; fore cannon or shank-part between knee and fetlock; pastern coronet; hoof.

(vi) Other parts:

(a) Male: scrotum, prepuce, penis;
(b) Female: vulva, udder, front and rear attachements of udder, teats, milk vein, milk well.
(c) Both Sexes: anus, navel, navel flap, tail, switch of the tail.

2.3 Precautions

— Put on high shoes while going near animals.
— Put on a working overall (apron) while working near animals.
— Learn the description of various terms used for body parts by heart before practicing with the animal.
— Remain quiet and behave gently while near the animal.

2.4 Materials required

1. Rope or chain for securing the animal.
2. Poster showing the details of the external anatomy of the dairy animal.

2.5 Procedure

— Study the body parts in the following order: head, neck, trunk, hind limbs, fore limbs and other parts.
— Observe carefully the location of the different parts of the animal.
— Practise by touching the location and correctly naming the parts of the bull, cow and buffalo.
— Describe the various regions of the body as:
Dorsal (top or back side);
Ventral (the belly side or under-surface of the body);
Cranial (towards the head or front);
Caudal (toward the tail or rear); and
Lateral (sides of the animal).

2.6 Observations

The pupil should locate each part of the body in the order mentioned in the procedure and write down the name of each part without referring to the relevant information. Then he should find out the missing names from this list by comparing it with the names given in the relevant information. He should try a second time or even a third, until he knows all the names. Use the following proforma for this purpose.

External body parts of cow/bull

Major regions	First trial	Second trial	Third trial	Check by the teacher
Head :				
Neck :				
Trunk :				
Hind Limbs :				
Fore limbs :				
Other parts :				

2.7 Expected behavioural outcomes

The pupil will be able to :
— recognize the body parts of animals correctly;
— locate the external abnormalities;
— recognize the major regions of the body:

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Fill in the blanks with proper word

(i) The equivalent of the knee joint in the foreleg is _____ in the hind leg (fetlock/hock).
(ii) The part that joints the hindlegs to/the trunk is _____ (thigh/stifle).
(iii) The part between elbow and knee is known as _____ (thigh/arms).
(iv) Develop is absent in _____ (cow/buffalo).
(v) The hollow in front of the hips and stifle is _____ (abdomen/flank).
(vi) Brisket is the fleshy prominent mass lying between the _____ (forelegs/hindlegs).

ACTIVITY UNIT 3

Description of Dairy Animal

3.1 Instructional objectives

The pupil should be able to :

— describe the given animal correctly;
— record the description of the animal in a standard form.
— locate a given animal from a group, based on description alone.

3.2 Relevant information

Purpose of description:

It is often necessary to describe animals clearly so as to establish the identity of the animal in legal cases-thefts, wanton injury to animals, wanton killings, ownership disputes, insurance claims, identifying pedigree and record keeping. The owner, operator or stockman should be able to establish the identity of the animal concretely by its description.

Principle of description:

On organized farms, every animal is artificially marked with a specific number which is recorded. But in villages, no such artificial marking is done. This makes it necessary to identify the animal by describing all its external features. These external features are of two types - natural and acquired.

(i) Natural features:

Natural features are those that the animal possesses right from the time of birth or develops later naturally. These may get altered with age but are permanent in nature. Examples of natural features are-height, length, colour, moles, etc.

(ii) Acquired features:

Acquired features are those that are not present at the time of birth or develop naturally later, but are acquired by animals as a result of injury, disease or man-made marking. Examples are-scars, warts, brandings, etc.

3.3 Precautions

— Follow a definite order in describing the features of animals, viz. head, neck, body, forelegs, hindlegs, tail, and other parts.
— Make sure that you know the external anatomy of the animal well before starting the description.
— Describe only such features that are of permanent nature.

3.4 Materials required

1. Description sheets or proforma if available, or white paper.
2. Pen or pencil.

3.5 Procedure

1. Identification of body colours:

— Observe whether the animal has a solid colour throughout the body or is marked by 2 or more coloured patches.
— Write down the colour of solid coloured animals clearly by using one of the following terms:

(i) Black; (ii) White; (iii) Red; (iv) Brown

(light, medium or dark); (v) Grey (mixture of black and white coloured hairs).

— Write down the colour pattern of double-coloured animals clearly by using one of the following terms: (i) Piebald-large irregular black and white patches that have clearly demarkated borders (ii) Skewbald large irregular black and white patches that are clearly demarkated. (iii) Mottled or specked-small, clear, round, light coloured patches on a dark background or vice versa.

— Describe as 'odd coloured' any animal whose colouring pattern can not be clearly described.

2. Description of natural marks on head:

— Describe the white coloured marking on face, muzzle and eyes using the following terms and describing their size, shape and intensity: (i) Star-any white mark on forehead; (ii) Stripe-white markings on lower face and on nasal bones; (iii) Blaze-white marking covering almost the whole face; (iv) White face-all head white; (v) Sinopia any-isolated white mark around nostrils (vi) White muzzle; (vii) Wall eye-cornea of eye white or pink; (viii) Flesh marks on lips- absence of pigment.

3. Description of natural marks on body and limbs:

— Use the following terms for describing natural marks on body and legs; (i) Mole-dark coloured flat or raised birth marks; (ii) Flecked-small collection of white hairs irregularly distributed on dark body colours; (iii) Black marks-small areas of irregularly distributed black hairs on light background; (iv) Spots-any irregularly distributed bunches of hair that are different from the general colour; (v) Patch-larger, well defined irregular area, specify colour; (vi) Whorl-spiral patterns of hairs with a clear central point.

— Give exact location of the natural marks on the body and describe their size and shape.

— Give nature of hooves as dark, light, cracked or broken.

— Describe the colour of the switch of the tail and length of the tail.

4. Description of acquired marks:

— Describe the marks always in the following order: on the head and neck, on the body, on the fore limbs and on the hind limbs.

— Give the exact location and size of the acquired marks.

— Describe the acquired marks using the following specific terms: (i) Scar or scars; (ii) Wart or warts (raised pedunculated structures on skin) (iii) Bandage marks; (iv) Operation wound marks; (v) Croked limbs (due to fractures or disease); (vi) Docked tail (tail amputated, give at what length); (vii) Broken horns; (viii) Polled (horns removed); (ix) Absence of any limb; (x) Galls (on neck due to yoke, on hips due to side beams of carts, etc.); (xi) Tattoo marks.

5. Measures and weight of animals:

(i) Height:

— Use a measuring rod for measuring the height of the animal.

— Make the animal stand squarely on level ground.

— Measure the height as distance from the ground to the top of the back, immediately behind the withers/hump.

(ii) Length

— Use a measuring rod for measuring the length of the animal.

— Make the animal stand squarely on level ground.

— Take care to see that the animal is not bending sidewards.
— Measure length as the distance between the point of shoulder and point of buttocks (pin bones).

(iii) Girth:

— Use a measuring tape for taking the girth of animals.
— Pass the measuring tape fully around the chest of the animal just behind the forelegs and record the chest measurement.
— For abdominal girth, measure the circumference of the abdomen immediately in front of the udder.

(iv) Weight:

— Keep the animal without feed and water from the previous evening.
— Weigh the animal early in the morning before offering any feed or water.
— Use a platform scales for weighing large animals.
— Record the weight of the animal on the scale only when the animal stands quietly after initial struggling.
— Weigh small calves by hanging them on a spring balance with the help of a sling made of ropes or a cycle tyre passed around the trunk of the calf.
— When no balance is available, estimate the approximate weight of animals from body measurements using the following formulae.

Formula for cattle:

Body weight (kg) = (chest girth in cm) + (abdominal girth in cm) + 0.7 (length in cm) – 490.

Formula for buffaloes:

Body weight (lb) = 25.156 x (chest girth in inches)-960.232.

Note: 1 kg = approximately 2.2 lb.

3.6 Observations

The pupil should take a few animals and practise describing them in the following proforma.

Description of the animal

1. Name of the owner
2. Animal number/name (if any)
3. Age (estimated/recorded)
4. Sex
5. Colour
6. Breed
7. Height
8. Length
9. Girth
10. Head
11. Body
12. Forelegs
13. Hindlegs
14. Tail
15. Any other particulars

3.7 Expected behavioural outcomes

The pupil will be able to:

— describe the animal accurately.
— recognize colours and markings correctly;
— take measurements of animals without much error;

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Fill in the blanks with the appropriate word/words

(i) Natural as well as acquired markings are _____ in nature (permanent/superficial).

(ii) _____ of an animal is due to the presence of pigment in skin and hair (colour/scar).

(iii) Estimation of weight from formulae is based on the _____ between body measurements and weight (relationship/interdependence).

(iv) Body colours are _____ to breeds (specific/not specific).

(v) Acquired marks are due to _____ (injury and disease/natural reasons).

2. State whether the following statements are true or false by ticking (✓) the correct answer.

(i) Skewbald is the term used when there are large irregular black and white coloured patches with clear borders. (True/False).

(ii) A star is a white marking of any size on the forehead of an animal. (True/False).

(iii) The formula for estimating body weight of an animal gives an exact estimate of the body weight (True/False).

(iv) For measuring height the animal should be made to stand only on level ground (True/False).

(v) Moles are natural markings present right from the time of birth (True/False).

ACTIVITY UNIT 4

Identification of Dairy Animal

4.1 Instructional objectives

The pupil should be able to:

- **identify the animals correctly;**
- **use the marked numbers in maintaining records on the farm;**
- **use the marked numbers in feeding of animals;**
- **perform each method of identification confidently.**

4.2 Relevant information

Under scientific dairy farming it is necessary to maintain records on all aspects like breeding, feeding, milking, reproduction, vaccination, etc. When the number of animals involved is large, identifying individuals by a description of their external features becomes impossible. Nowadays, banks giving loans for purchase of dairy animals and cattle insurance companies demand fool-proof identification of their clients' animals by proper numbering. This calls for the use of some artificial methods of marking animals. Generally, numbers and letters are marked on the body of the animals in a serial order. Such marks should be clear, permanent in nature and legible. The different methods of identification are as follows:

Tattooing:

Tattooing consists of piercing outlines of the desired number or figures on the skin inside the ears and then incorporating a black vegetable pigment into these punctures (Fig 4.2.1) Young calves should be tattooed as early as possible after birth.

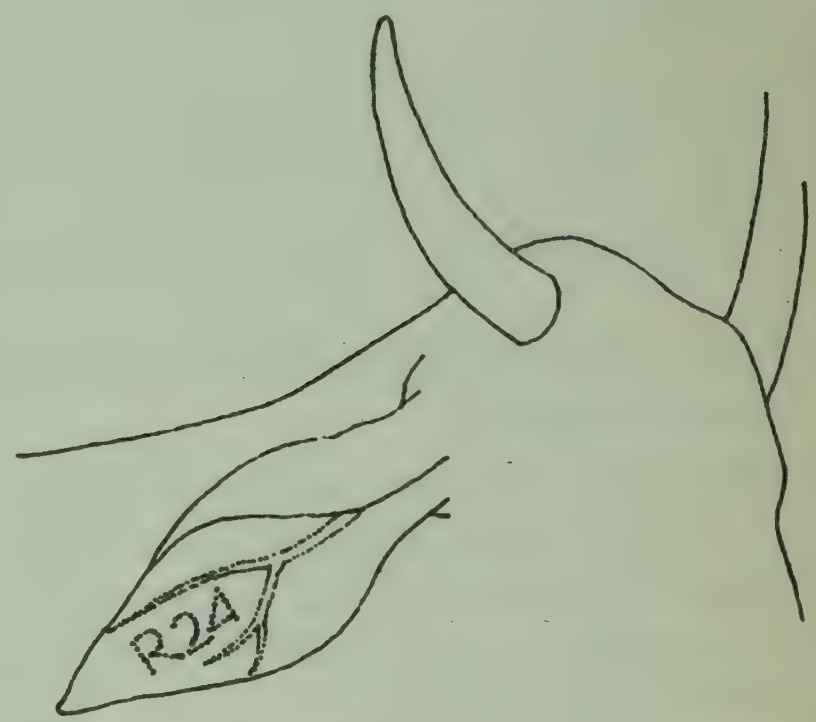


FIG. 4.2.1 EAR TATTOO

Ear tagging :

Tagging is done as soon as possible after birth in place of tattooing. It comprises fixing numbered aluminium tags along the outer border of the ears of calves, using special forceps (Fig. 4.2.2).

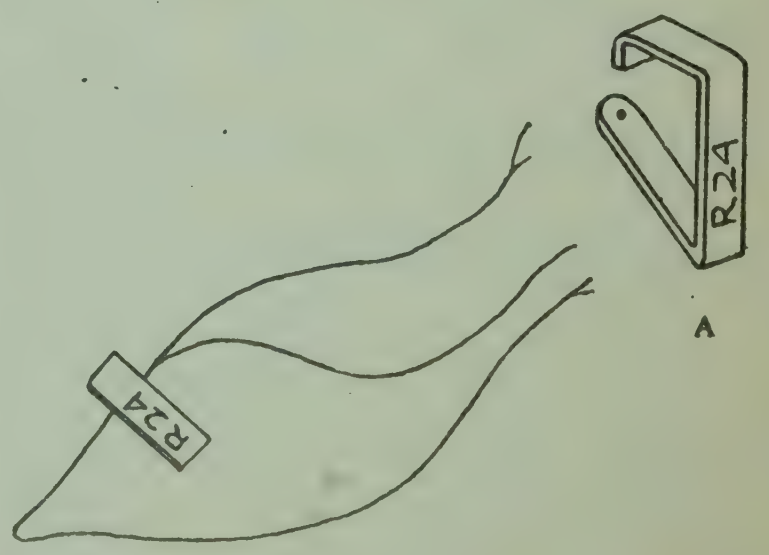


FIG. 4.2.2 EAR TAG IN POSITION A. AN EAR TAG.

Branding:

This involves making a permanent impression on the skin of the animal (Fig. 4.2.3) Such marking is quite distinct, difficult to efface, can not be lost by normal wear and tear and can be read without close examination of the animal. Calves around 10 months of age can be branded. Branding irons are used for this purpose. There are two types of branding-hot branding and cold branding. Branding is done on the hind qurter, trunk, shoulder, neck and limb, below the level of stifle.

FIG. 4.2.3 BRANDING

4.3 Precautions

— Use only good quality tattooing and branding ink made by reputed firms.
— Always shake ink bottle well before use.
— Avoid using defective equipment.
— Avoid injuring blood vessels and nerves.
— Leave sufficient space for growth of the ear in tagging.
— Do not brand animals during the rainy season due to the fly problem.
— For branding, the figures should be big and separated by at least 2-5 cms from each other.
— Control the animal properly before marking.

4.4 Materials required

A) Tattooing:

(i) Tattooing forceps with figures and numbers.
(ii) Tattooing ink.
(iii) Spirit
(iv) Cotton.

2) Tagging:

(i) Aluminium tags
(ii) Tagging forceps
(iii) Disinfectant
(iv) Ear punch set

3. Branding

(i) Copper branding iron set.
(ii) Coal and coal stove
(iii) Mustard oil
(iv) Zinc oxide
(v) A metal cup (katori)
(vi) Cotton
(vii) Ropes
(viii) Branding ink

4.5 Procedure

1. Tattooing

— Find out the numbers to be tattooed and arrange them on the tattooing forceps.
— check the number for correctness on a piece of carboard or paper.
— Secure the calf and hold its ear horizontally.
— Locate the numbering place on the inner side of the ear, preferably in between the two large veins.
— Clean the portion with spirit to remove dirt and grease.
— Apply tattooing ink liberally with cotton.
— Hold the tattooing forceps in such a way

at the jaw with pad is outside and the
v having the numbers is inside the ear.
ess the handle of the forceps with gentle
essure, stopping only on hearing a
cking sound.
old the forceps for a while.
pen and remove the forceps,
pply more ink on the site and rub it well
ith the thumb into the punctures.
elease the calf and clean the set
roperly.

r Tagging

ecure the animal.
unch a hole first in the upper edge of the
r as close to the head as possible with an
r punch.
lake sure that the punch is far enough
om the border of the ear so that the tag,
hen in place, will be tight on the ear or
winging free, yet leaving sufficient space
or the growth of the ear.
lace one end of the tag through the hole
nd lock it in position with the pincers or
ne tagging forceps.
ee that the numbered side of the tag is on
ne back (top) side of ear.
pply some antiseptic to the wound to
ncourage healing and prevent infection.
ellow the same procedure with the self-
iercing type of tags, except for the prior
unching of holes.

randing:

t branding

Get the coal stove burning and place the desired copper branding irons in the fire.
— Cast the animal on a soft ground and secure properly.
— Clip the area to be branded and clean it with the help of a brush or cloth.
— Remove the desired number brand from the fire when it becomes dull red hot.
— Press the hot brand number gently with uniform the fire when it becomes dull red.
— Apply mustard oil (containg 5% zinc oxide) on the brand mark.
— Fellow the same procedure if more numbers are to be branded.

(ii) Cold branding:

Put a pad of cotton at the bottom of a metal cup and pour chemical branding ink into it will the cotton gets thoroughly soaked.
— Cast and secure the animal.
— Choose appropriate numbers/figures of brands.
— Wet the numbers/figures of the branding iron with ink by pressing them on the ink-soaked cotton in the cup.
— Press the wet (but not dripping) brands on the skin gently and with uniform pressure, for a few seconds.
— Remove brand and free the animal.

4.6 Observations

The pupil should carry out tattooing, tagging and branding on at least one animal each. Then he should observe the markings after one week, one month and six months and record his observations as follows:

Legibility of mark	Observation after		
Extent of healing	One week	One month	Six months
Injury to the part			
Intensity of colour of mark			

NOTE: Give the notations as +++ = good/clear; ++ = fair; + = poor; — = failure.

4.7 Expected behavioural outcomes

The pupil will be able to:

— carry out tattooing properly;
— carry out tagging properly;
— carry out branding properly,
— read out old identification marks correctly.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Fill in the blanks with the appropriate word

(i) _____ has to be carried out as early as possible after birth (tattooing/branding).
(ii) The inside of the ear is cleaned with _____ to remove ear wax that may interfere with tattoing (spirit/water).
(iii) Branding should not be carried out in _____ season due to the fly menace (rainy/winter).
(iv) Tagging is done on the _____ (ears/tail).
(v) Proper _____ of animal is the first step in carrying out branding (control/feeding).
(vi) The identification marks should be _____ in nature (permanent/beautiful).
(vii) Either tagging or _____ can be used for marking new-born calves (tattooing/branding).

ACTIVITY UNIT 5

Determination of Age by Dentition

5.1 Instructional objectives

The pupil should be able to:

— judge the age of animals by studying the teeth;
— identify the dentition of different categories of animals:
— realize the importance of aging.

5.2 Relevant information

Why aging by dentition?

In India, villagers rarely remark their animals are keep records on the birth, growth, production etc. Therefore, dentition is the only way for determining the age of animals.

What is dentition?

Dentition is the study of configuration and conformation of the teeth with special reference to the period of their eruption through the gums. It is possible, within certain limits, to estimate the age of animals by an examination of their teeth. Though such estimates are reasonably reliable, they are by no means always accurate. Considerable variations occurs with regard to the eruption of the teeth between different species of animals and between different breeds of livestock and between animals that are managed under different systems. The eruption of both temporary and permanent teeth depends upon the method of management, feeding and the breed of animals.

For the purpose of estimating the age of an animal, preference is given exclusively to incisers. The cheek teeth are only examined when irregularities are present in the incisors.

For the study of aging in animals, it is essential to know the structure of the tooth, parts of the tooth, types and classification of teeth, their functions, formulae, eruption tables and subsequent changes, which help in determining the approximate age of animals.

Types of teeth:

There are two sets of teeth in each species of animals:

1. Temporary or milk teeth:

These are present at birth or may erupt later but are pushed out by the growth of corresponding permanent teeth.

Difference between temporary and permanent teeth of animals

Temporary teeth	*Permanent teeth*
These are white in colour	These are brownish in colour
These are small in size	These are large in size
These have a distinct neck	These have no distinct neck
These have a short fang	These have a long stout fang
A small triangle of gum is seen between them	Little or no gum is seen between them

2. Permanent teeth:
These teeth appear at a certain age and remain in the jaws throughout the life of the animal.

Parts of the teeth and kinds of surfaces:

(i) Crown: This is that part of the teeth which appears above tne gums.

(ii) Lingual surface: The surface which remains in contact with the toungue or the inner surface of cheek teeth.

(iii) Root or Fang: The part of the tooth which is embedded in the gums.

(iv) Neck: The portion which joins the crown to the fang.

(v) Labial surface: The surface of the teeth next to the incisor teeth.

(vi) Buccal surface: The outer surface of cheek teeth.

(vii) Contact surface: The surface opposit the neighbouring tooth of the same dental are.

(viii) Wearing surface: The surface which comes in contact with the other jaw. It is also called grinding surface or masticatory surface.

Classification of teeth:

(i) Incisor teeth: These are located just inside the lips. They help in cutting and picking up food. They are described in pairs. Incisor teeth are temporary as well as permanent. In bovines, there are four pairs of incisors on the lower jaw. Only the upper jaw has a hard pad in place of incisors which is known as the dental pad. In the casè of cattle, the incisors are described as Ist pair or central incisors — the central-most incisors arc on either side of the medial line; medial or 2nd pair-those next to central incisors; lateral or 3rd pair those next to the 2nd pair; and corner or 4th pair-the outermost lateral pair of incisors.(Fig. 5.2.1).

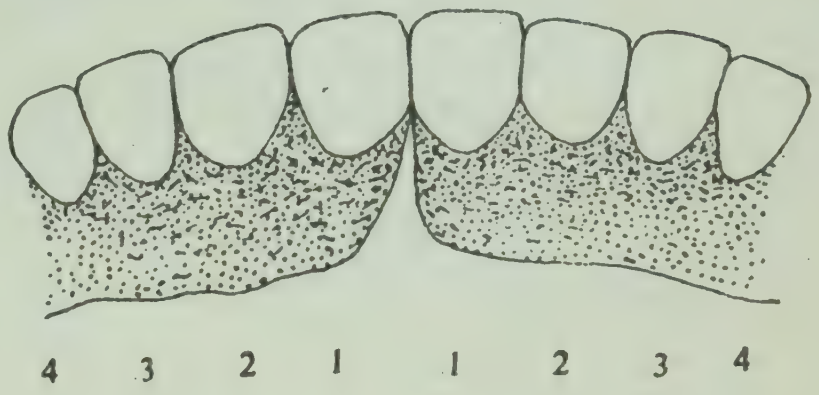


FIG. 5.2.1 INCISOR TEETH OF BOVINESS, 1. FIRST PAIR OR CENTRALS, 2. SECOND PAIR, 3. THIRD PAIR, 4. FOURTH PAIR OR CORNERS.

(ii) Cheek teeth: Premolars and molars that are situated just near the cheeks are together known as cheek teeth. These are twenty-four in number, six on each side of each jaw. They are described as Ist, 2nd 3rd, 4th, 5th and 6th pair. The first three are identified as premolars-they are temporary as well as permanent-whereas molar teeth are always permanent. The function of cheek teeth is mastication of food.

Dental formulae:
The total number of teeth present in the mouth of any particular species of animals can be expressed in a simple form of figures called the dental formulae

Temporary dentition: $2(\frac{0}{4}, \frac{0}{0}, \frac{3}{3}, \frac{0}{0})$

Total 20

Permanent dentition: $2(\frac{0}{4}, \frac{0}{0}, \frac{3}{3}, \frac{3}{3})$

Total 32

In these formulae the numerators of the various fractions represent the number of the particular type of teeth in one half of the upper

jaw and the denominator, the number in one half of the lower jaw of the animal. By multiplying each figure by two and then adding together the individual figures, both numerator and denominator, the total number of teeth is obtained. The first figures represent incisors, the second the canines, the third pre-molars and the fourth the molar teeth.

5.3 Precautions

— Handle the animal with care
— Note the number of teeth and their wear carefully.

5.4 Materials required

1. Rope 5 m long
2. Mouth gags
3. Animals - 5 (Young and milking)

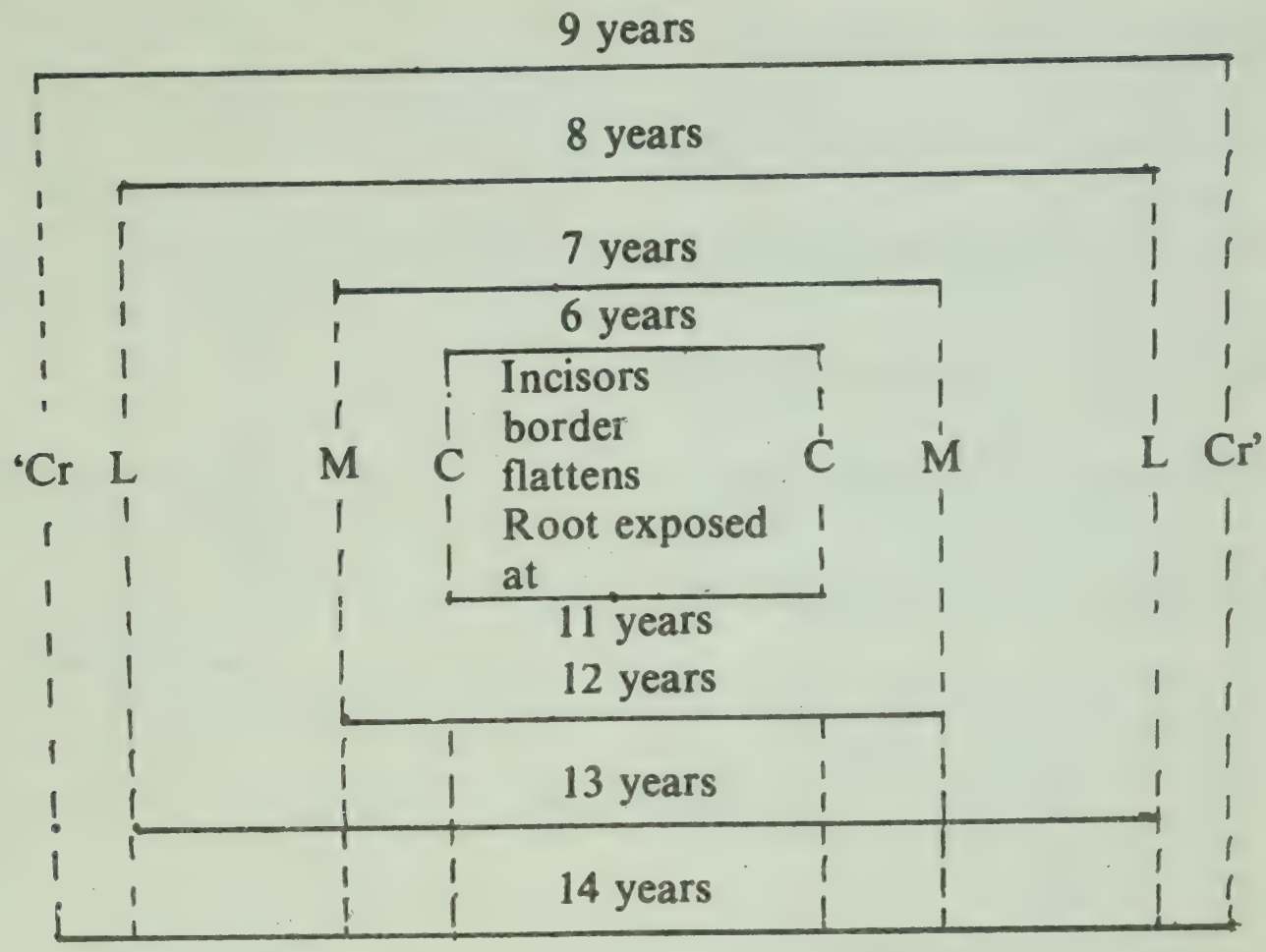
5.5 Procedure

— Approach the animal quietly.
— Hold the animal properly.
— Open the mouth and observe dental position as per eruption table for judging age up to 5 years.
— For over 5 years, judge age by the extent of wear of incisor as per the following guidelines.

Eruption Tables:

The following table gives the age of eruption of different types of teeth.

Time of eruption	*Incisors*	*Cheek teeth*
Birth to one month	All temporary incisors	First three pairs of temporary cheek teeth
6 months	—	Fourth pair of permanent cheek teeth
1½ years	—	Fifth pair of permanent cheek teeth
2 years	Central pair of permanent teeth	1st, 2nd and 6th pairs of permanent cheek teeth
2½ years	—	Third pair of permanent cheek teeth
3 years	Medial pair of permanent teeth	—
4 years	Lateral pair of permanent teeth	—
5 years	Corner pair of permanent teeth	—



Note: C — Central pair
M — Medial pair
L — Lateral pair
Cr — Corner pair

5.6 Observations

The pupil should record the followings for each animal:

Particulars	*Record No. and wear of teeth*	*Approximate age of the animal*
	1 2 3 4 5	*1 2 3 4 5*
No. of temporary incisors present		
No. of permanent incisors present		
Extent of wear of different incisor teeth.		

5.7 Expected behavioural outcomes

The pupil will be able to:

— differentiate between the temporary and permanent teeth;
— count the total number of teeth present in the mouth;
— explain why dentition is used for aging the animals;
— classify the different parts of the teeth.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick mark (✓) the correct answer

(i) A small triangular area of the gums is seen between _____ (temporary/ permanent) incisors.
(ii) Flattening of incisors begins at _____ of age. (6/8 years)
(iii) Central permanent pairs of incisors appears at the age _____ (4/2 years).
(iv) First three pre-molars are present at _____ (birth/6 months of age).
(vi) The third pair of incisors is known as _____ (lateral/medial pari).
(vi) Cheek teeth are known as _____ (molars/incisors).
(vii) In cattle and buffalo the incisors are _____ (present/absent).

ACTIVITY UNIT 6

Care of the New-born Calf

6.1 Instructional objectives

The pupil should be able to:

— recall the various stages of calving, approaching calving
— maintain the new-born calf in healthy conditions
— organize the various activities at the time of calving,

6.2 Relevant information

What is calving?

Calving is the act of a cowor buffalow giving birth to a young one i.e. the calf. When the term of pregnancy is over the calving process starts. The duration of pregnancy is 285 days in cows and 305 days in buffaloes. About 10 days before or after the expected date, calving is considered normal. If the date of mating/serving the cow is known, the expected date of calving can be estimated by adding the duration of pregnancy to it. The calving process comprises different stages-commencement of labour pains, appearance of the water bag through the vulva bursting of the water bag, appearance of the forefeet of the calf through the vulva, gradual expulsion of the calf, complete delivery of the calf, and fall of after birth.

Why care of the new-born calf? :

Until just before birth, the calf gets all its nutrient and oxygen requirements from the mother through the navel cord. But immediately after birth, the calf must get the oxygen through breathing. This is a very critical moment in its life. There are other delicate conditions peculiar to the new-born calf. Hence the need for special care of it.

Symptoms of animal approaching calving

About 10 days prior to calving, the teats of the cow start getting plump and engorged. The animal looks obviously heavy in its bearing and movements. The sacro-sciatic ligaments located on either side of the rump get slackened and one can note distinct depressions in the region. The vulva becomes enlarged and wrinkles appear on it. A day or two before calving, the animal goes off feed and seeks quiet corners.

6.3 Precautons

— See that the pregnant cow is not disturbed by dogs and children or made nervous by other means.
— Be calm and gentle in your behaviour at the time of calving.
— Never interfere with the act of calving unless something really serious warrants it.
— Observe strict hygiene and clean iness at the calving place.
— Pay attention to both the mother and the calf.

6.4 Material required

1. Buckets
2. Stove.
3. Ropes
4. Concentrated feed mixture
5. Crushed maize

6. Wheat bran
7. Physical balance
8. Jaggery
9. Coarse cloth
10. Smelling salt (Ammonium hydroxide)
11. Obstetric hooks with ropes
12. Plenty of clean water.

6.5 Procedure

1. Care before the birth of the calf:

— Transfer the pregnant cow to a separate spacious (at least 3x4 m) pen about 10 days prior to the expected date of calving.
— Provide plenty of drinking water in the maternity pen.
— Keep the cow on light but concentrated feeds during the last few days of pregnancy: the mixture should contain 40 parts of crushed maize or barley, 10 parts of wheat bran, 20 parts of groundnut cake, 28 parts of crushed gram and one part each of salt and mineral mixture.
— Provide 3 kg of the above concentrate per day, giving 1 kg each in the morning, day time and evening.
— Feed legume hay if available.
— Keep the cow under constant observation as it nears the calving time.

2. Care during calving time:

— Do not disturb the cow unnecessarily unless otherwise warranted.
— Watch whether the various stages of calving are taking place in correct order and within reasonable time.
— Help the cow to lie down (if it is weak), when the forelegs, head and neck of the calf are already out of the vulva.
— Provide aid in delivering the calf (if the cow is weak) by pulling the calf in an arch backwards and slightly downwards (towards the hocks of the cow)
— Use obstetric hooks to deliver the dead calf in case of difficulty.
— Call a veterinarian promptly if the situation so demands.
— Feed crushed maize and jaggery to the mother around calving time for strength.

3. Care after birth:

— Immediately after birth, make sure that the calf is breathing normally. Perform the following acts to ensure that the calf can breathe normally.

(i) Clear mucus and membranes from the nostrils of the calf by sqeezing the nose or by holding the calf upside down for a minute (ii) press and release chest with both palms rhythmically to induce respirations. (iii) put an open bottle of smelling salt (ammonium hydroxide) near the nostrils; (iv) resort to mouth to mouth breathing in extreme cases.

— Rub and dry the calf thoroughly with a coarse cloth, especially if the mother, due to weakness, is unable or unwilling to do so.
— Help the calf stand if it does not do so within 20 minutes.
— Help the calf seek the teats of its mother and start suckling even before fall of the afterbirth.
— Record sex, weight, date of birth, dam and sire number of the calf in appropriate records.

6.6 Observations

Time taken from commencement of labour pains to appearance of water bag and bursting.

— Time taken from bursting of water bag to complete delivery of calf.

— Time taken from delivery of calf to the complete fall of after birth

— Time taken for the calf to stand up after birth.

— Weight of calf

— Sex of calf

— Any other particular observation.

6.7 Expected behavioural outcomes

The pupil will be able to:

— identify cows nearing calving time correctly;
— take care of normal calvings;
— perform all needed operations for the well-being of the new-born calf.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. State whether the statements are True or False by ticking (✓) the correct words.

(i) There is a critical change in the life of the calf at the time of birth (True/False)
(ii) As soon as the water bag bursts and the feet of the calf appear through the valva, the calf should be delivered by pulling the feet (True/False)
(iii) Cows should not be disturbed during the last stages of pregnancy (True/False)

(iv) The duration of pregnancy is longer in buffaloes as the buffalo calf is larger in size than the cow calf at the time of birth (True/False)

(v) The very first thing to be done after the delivery of the cow is to see that it suckles its mother (True/False)

(vi) One should not wait untill the fall of after birth for allowing the calf to suckle its mother (True/False)

(vii) The birth particulars of the calf are necessary for implementation of breeding plans on the farm. (True/False).

ACTIVITY UNIT 7

Weaning Calves

7.1 Instructional objectives

The pupil should be able to:

- recall the importance of weaning calves;
- wean the calf from mother efficiently;
- realize the possible repercussions of weaning on the mother.

7.2 Relevant information

What is weaning

Weaning means separation of the calf from its mother so that it cannot suckle any longer. Under natural conditions, the mother does not allow its young one to suckle as soon as the latter is able to thrive on feeds other than milk. But under commercial dairy farming conditions, the farmer or dairy man has to carry out weaning himself.

Why weaning?

Actually the cow's milk is meant for its calf as in the case of all mammalian species. But with the development of the cow as a dairy animal, it produces milk far in excess of the needs of its calf. Since milk is a costly item, the farmer/ dairy manager prefers to sell it rather than feed it to the calf. The calf can be fed on more economical feeds like milk replacers and calf starter mixtures. Further, weaning allows milking cows to be milked quickly, efficiently and hygiencially when the calf is not there. Normally, the lactation of Indian cattle is disturbed or even suddenly terminated when the calf dies. This problem can be over-come by weaning the calf and teaching the cow to give milk without its calf.

When to do weaning?

Weaning is best done at birth. Some people do it after colostrum feeding. In Indian cattle and buffaloes that are more temperamentally attached to their calves, weaning has to be done by 3 or even 6 months after birth so that the dam's lactation may not be disturbed. In such cases, generally, the calves are used only to initiate the let-down process while milking, without actually letting the calf consume the milk. All weaned calves have to be fed milk by hand.

7.3 Precautions

- Carry out weaning even before the cow has an opportunity to lick its calf.
- In indigenous cows and buffaloes, carry out weaning only in the first calvers as weaning often fails in older animals.
- Continue weaning in succeeding lactations.
- Carry out weaning in any lactation of any cow in the case of crossbreds and exotic breeds.
- Feed only clean and fresh milk to weaned calves.

7.4 Materials required

1. Milk pail
2. Nipples
3. Bucket with nozzle
4. 2 × 1 m coarse cloth or jute mat

7.5 Procedure

1. Weaning at birth:

— Keep a close watch on the cow nearing parturition and remain close by.
— Watch for the moment when the cow lies down for finally delivering the whole calf.
— Transfer the just born calf quickly on to a 2 x 1m coarse cloth or jute mat spread nearby on the ground, even before the cow gets up.
— Carry away the weaned calf to the young calf pen.
— Attend to the immediate needs of the calf as soon as possible.
— Teach the calf to drink milk from a pail.

2. Weaning at a later age:

— Carry out weaning operation at later ages spread over a week or ten days.
— Start by using the calf only for let-down of milk without actually allowing it to consume milk.
— Massage and manipulate the teats gently with your finger simultaneously as the calf suckles.
— After two days, use your finger only for let-down by teat manipulation without allowing the calf to actually apply its mouth to the teats, though it is allowed to stand near the udder.
— After two or three days more tether the calf a little far away from the cow but within sight and continue using fingers for obtaining let-down.
— After 2 or 3 more days, tether the calf farther away from the cow, thus weaning it away from milk.
— In difficult cases feed concentrates to the cow as a bait during milking so that her attention is diverted from the weaning process.

3. Teaching weaned calves to drink milk from pails:

— Use either freshly obtained milk or if the milk is cold, warm it up to near body temperature of the calf (38°C) before actual feeding.
— Pour the milk into a clean and dry, deep basin or a wide-mouthed milk pail.
— Place the milk pail on a stand or stool at a height of about 30 cm from ground.
— Bring the calf near the pail.
— Dip your fingers into the milk.
— Introduce the fingers wet with milk into the mouth of the calf and allow it to suckle your fingers.
— Repeat this a few times.
— Gradually lower your palm into the milk with your fingers still in the calf's mouth.
— Let the calf continue to suckle for some time your fingers that are already submerged in milk.
— Withdraw your fingers steadily from the mouth of the calf as it keeps on suckling.
— Watch the calf continuously while drinking milk from pail.
— In difficult cases, feed milk to calves with a rubber nipple fixed to a nozzle of a milk bucket.

Grade

7.6 Expected behavioural outcomes

The pupil will be able to:

— wean the calf at birth efficiently;
— wean the calf at a later age efficiently;
— train the calf to drink milk from a pail.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. State whether the following statements are true or false by ticking (✓) the correct answer

(i) Weaning is necessary for making the cow comfortable. (True/False)
(ii) Weaning is best done at birth. (True/False)
(iii) It is difficult to wean calves of indigenous breeds of cows and buffaloes. (True/False)
(iv) Weaning right from the first lactation is necessary in the case of crossbred and exotic cows. (True/False)
(v) Weaning at later stages has to be completed in just one milking. (True/False)
(vi) Only boiled milk has to be fed to weaned calves (True/False).
(vii) The milking pail from which the weaned calf drinks milk should be at ground level (True/False).

2. Fill in the blanks with the correct word.

(i) Weaning helps to obtain _____ (more milk/better quality milk) from cows.
(ii) Weaned calves can also be fed on _____ (milk replacers/concentrate mixture).
(iii) The temperature of milk fed to weaned calves by hand should be _____ (20°C/38°C).
(iv) Weaning helps in avoiding loss of _____ (lactation/pregnancy) due to sudden death of calves.

ACTIVITY UNIT 8

Feeding Colostrum

8.1 Instructional objectives

The pupil should be able to:

— recall the value of feeding colostrum;
— feed colostrum to the new-born calf correctly;
— prepare the substitute of colostrum in case it is not available naturally

8.2 Relevant information

What is colostrum?

Colostrum is the first milk secreted by a cow or buffalo following calving. It is viscous and yellow in colour, and contains much more protein, ash (minerals), carotene and vitamin 'A' than normal milk. It is laxative in nature and helps in elimination of the material accumulated in the digestive tract before the calf was born. This is the single most important ingredient which is administered as soon as possible after the birth of the calf.

Antibodies in colostrum:

Colostrum also contains antibodies that help to protect the calf from diseases. The young calf is born practically without antibodies in the blood. Antibodies are gamma globulins in the blood (one of the protein fractions present in the blood plasma). Due to the large molecular weight of gamma globulin molecules, they cannot pass through the placenta, thus the natural source of antibodies for the calf is through feeding of colostrum.

Shortly before calving, the gamma globulins from the blood serum of the cow are concentrated in the colostrum by the udder. Colostrum contains 75-100 times as many gamma globulins i.e. antibodies, as milk. This level quickly falls at each milking, within 48-hours. The colostrum globulins are absorbed across the intestinal wall and reach the blood circulation after some time.

Thus, these important properties of colostrum makes it very important to pay particular attention to colostrum feeding of the calf during its first day of life.

When to feed colostrum?

The colostrum is fed to the calf as soon as it is born, preferably within half an hour. The quantity of colostrum fed to the calf depends on the body weight of the calf and is given at the rate of 10 percent of its body weight. This quantity is divided into two or three feedings depending on whether the cow is milked twice or thrice in a day. When the calf is separated from its mother at birth, the colostrum is fed by hand. The colostrum feeding is continued for five days after the birth of the calf.

How to prepare substitute of colostrum:

In case the cow dies or does not give colostrum, a substitute of equal nutritive value has to be given to the calf. Substitute colostrum is prepared by mixing two whipped eggs with 30 ml of castor oil. The mixture is fed along with normal milk in the same quantity (1/10th of the body weight).

8.3 Precautions

— Feed fresh colostrum from a clean, washed udder under hygienic conditions.

- Keep the temperature of the colostrum around 38 C at the time of feeding.
- Scrupulously avoid soiled hands and pails when feeding colostrum to a weaned calf.
- Do not withhold feeding colostrum until the fall of the afterbirth of the cow; rather, see that the calf gets colostrum as early as possible after birth.
- Ensure whipping of egg and mixture with castor oil thoroughly.
- Avoid over feeding and wrong feeding of colostrum. This leads to digestive troubles and pneumonia.
- Do not feed colostrum from udder afflicted by mastitis.

8.4 Materials required

1. Clean water
2. Bucket
3. *Khadi* cloth
4. Plastic milk feeding pail
5. Fresh eggs
6. Castor oil
7. Common salt
8. Potassium permanganate solution
9. Muzzle (bamboo, wire or leather)
10. Clean milking pail
11. Teaspoon (stainless steel)
12. Normal milk

8.5 Procedure

1. Unweaned Calf:

- Clean the udder of the cow that has just calved.
- Mop and dry the udder with *Khadi* cloth.
- Lead the calf to the udder of the cow. (Invariably, the calf has a natural instinct to search for the udder, hence it requires little assistance.
- Ensure that the calf suckles only two quarters of the udder as suckling all the four quarters may lead to over feeding.
- Ensure adequate colostrum to the calf (desired quantity is 1/10th of the body weight to be fed twice, by allowing the calf to suckle for 3-4 minutes after let-down).
- Clean the mouth of the calf with *Khadi* cloth after suckling.
- Apply a pinch of common salt on the tongue to prevent licking.
- Apply muzzle also to prevent licking of walls and other odd objects.

2. Weaned Calf:

- Wash and clean the feeding pail with potassium permanganate solution.
- Clean the udder of the cow, mop and dry with *Khadi* cloth.
- Milk the colostrum in a clean milking pail.
- Pour the colostrum in the feeding pail in desired quantity.
- Lead the calf to the pail with the left hand.
- Dip the finger of the right hand into the feeding pail.
- Put the middle finger into the mouth of the calf while it is dipped in the tub.
- Allow the calf to get the instinct of sucking fingers.
- Ensure feeding of colostrum completely.
- Wash the pail with water and potassium permanganate solution after use.

3. Substitute of colostrum to Orphan Calf:

- Break two eggs and collect contents in a bowl.
- Beat the eggs with a spoon so as to mix the albumin and globulin parts thoroughly.
- Add 30 ml of castor oil in egg yolk and mix well.
- Add mineral and vitamin supplements.
- Add desired quantity of normal milk to the mixture so that it is adequate for one feeding.

— Wash and clean the milk feeding pail.
— Pour the prepared milk mixture into the pail.
— Lead the calf to the pail.
— Proceed as per the procedure given above for the weaned calf,

8.6 Observations

The pupil should record the quantity of colostrum fed to the calf in the following table:

8.7 Calculations

The pupil should calculate the quantity of colostrum required for individual calves.

— Find out the body weight of the new-born calf
— Divide the body weight by 10 to get the quantity of colostrum required.

8.8 Expected behavioural outcomes

The pupil will be able to:

— recall the feeding value of colostrum;
— realize the role of antibodies in colostrum;
— feed colostrum to the new-born calf/ weaned calf correctly;
— feed colostrum substitute to the orphan calf.

Calf No.	*Colostrum fed (kg)*		*Remarks*
	Morning	*Evening*	
1.			
2.			
3.			

QUESTIONS

1. Answer the following in one or two sentences;

(i) What is colostrum?
(ii) When will you feed colostrum to a calf?
(iii) Write two precautions that you would observe in feeding of colostrum
1. _____ 2. _____

2. Fill in the blanks

(i) Colostrum contains------which protect the calf from diseases (antibodies minerals).
(ii) Colostrum contains more-----than normal milk (Protein/water).
(iii) Colostrum is fed within-----hour after the birth of a calf(1/2/6).
(iv) Common salt and muzzle is applied to the mouth of the calf to prevent----- (licking/suckling).
(v) Colostrum is fed at the rate of---- of the body weight in two or three feedings (1/10/1/15).

ACTIVITY UNIT 9

Dehorning Calves

9.1 Instructional objectives

The pupil should be able to:

— perform dehorning correctly;
— recall the importance of dehorning;
— visualize the behaviour of dehorned animals.

9.2 Relevant information

Dehorning:

Dehorning means removing the horns of animals. Disbudding means the arrest of horn growth at an early age when the horn root is still in the form of a bud or button. Calves are dehorned when they are 4-10 days old or as soon as the horn buttons can be easily detected.

Why dehorning?

Horns serve no useful purpose on dairy animals; they can be a nuisance and cause many body and udder injuries. Commercial dairymen should remove the horns for the following reasons: (i) More space is needed for horned cattle in sheds and barns; (ii) cattle with horns inflict more damage on equipment; (iii) there is more danger to the operator in handling cattle with horns; (iv) horned cattle are inclined to fight and will keep others away from the feed; and (iv) cattle with horns inflict injuries on one another that may result in heavy economic losses.

9.3 Precautions

— Protect yourself against injury while performing the operation.
— Protect your eyes against the chemical if chemical dehorning is practised.
— Apply a fly-repellent to the wound if the operation is performed during the fly season.
— Keep hot iron and tincture of benzoinco handy to prevent possible bleeding.

9.4 Materials required

1. Chemical dehorning

(i) Caustic potash (KOH)/Caustic soda (NaoH)
(ii) A pair of scissors
(iii) Vaseline
(iv) Cotton wool soaked in surgical spirit
(v) Suitable bedding

2. Hot iron method:

(i) Dehorning iron or electric dehorner

3. Use of dehorning saw and clippers:

(i) Wood cutting saw
(ii) Dehorning clipper
(iii) Trevis

9.5 Procedure

1. Chemical dehorning:

— Secure the calf gently on the bedding and turn the head a little towards the operator.
— Locate the horn bud and clip the hair around the bud up to a width of 2 cm.
— Rub the horn bud with a piece of cotton wool soaked in surgical spirit.

— Apply a ring of vaseline around the horn bud to protect the eyes from the spreading chemical.
— Rub the chemical over the button in a circular motion until blood appears or it becomes reddish in appearance.
— Wipe the surface with cotton and apply some dusting powder.
— Treat the other horn bud similarly.

2. Hot iron method:

(i) Using electric dehorner:

— Secure the calf on the bedding near a source of electricity.
— Plug in the electric dehorner and let it become dull red hot.
— Locate the horn bud and clip the hair 2.5 cm around the bud.
— Apply the dehorning iron on the bud till it burns (a few seconds).
— Repeat the same on the other horn bud.

(ii) Using dehorning iron:

— Heat the dehorning iron to red hot in coal stove.
— Locate the horn bud and clip the hair around it.
— Apply the hot dehorning iron on the horn bud until it burns (a few seconds).
— Repeat the same on the other horn bud.

3. Use of dehorning saw:

— Confine the animal to be dehorned in a suitable cattle trevis or cast it and tie its legs.
— Control calves by throwing or by snubbing them to a post.
— Saw off the horn at about 1 cm away from the skin around its base.
— Apply antiseptic and leave the animal.
— Cauterize any bleeding with a hot iron or apply tincture benzoin co to stop bleeding.
— Bandage the horn if necessary

9.6 Observations

The pupil should carry out chemical dehorning, electric dehorning, use of elastrators and clipping of horns on atleast one animal each. Then he should observe the condition of the horns after one week and after one month.

Particulars	*One week*	*One month*
State of horns		
Healing status		
Effectiveness of operation		

9.7 Expected behavioural outcomes

The pupil will be able to:

— recall the importance of dehorning;
— carry out chemical dehorning hot iron dehorning and dehorning by using a wood cutting saw.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Tick mark (/) the correct answer

(i) While chemical dehorning, vaseline is applied around (horn bud/eyes).
(ii) Dehorning should be done at the age of (4-10/1-6 months).
(iii) In chemical dehorning, rubbing should be continuous till the bud (become dull red/appearsto give out blood).
(iv) Vaseline is applied to protect the (horn bud/eyes).
(v) Hot iron dehorning can be done (in all the seasons/in the dry season only).
(vi) While using a saw for dehorning, one should always anticipate (bleeding/burning).

ACTIVITY UNIT 10

Removing Extra Teats

10.1 Instructional objectives

The pupil should be able to :

— recall the importane of removing extra teats;
— differentiate between the extra teat and normal teats;
— carry out the operation of removing extra teats;

10.2 Relevant information

A good udder with four well placed, well shaped teats is important in a dairy cow. Extra teats on the udder of a cow serve no useful purpose and are unsightly. Extra teats may turn leaky later, and provide a route through which infection enters the udder. Hence, they should be removed while a heifer calf is still young i.e. under six months of age and easy to handle. The best time is when the calf is 2 months old.

10.3 Precautions

— Make sure that the teats you remove are "extras"
— Remove teats only at an early age.
— Apply antiseptic before and after removing the teats.
— Sterilize the instrument used for removing teats.

10.4 Materials required

1. Tincture iodine
2. A pair of scissors
3. Cotton
4. Rope for control
5. Hot iron strip

10.5 Procedure

— Secure the calf tightly.
— Clip hair around the extra teat(s) and mark them.
— Apply tincture iodine to the extra teat that is to be removed.
— Drawthe teat down and snip cleanly at the line where the teat joins the udder with a pair of sterilized scissors.
— If there is no bleeding, swab the spot with iodine.
— Cauterize with hot iron if bleeding is excessive.
— If flies are present, spray a fly repellent on the wound.

10.6 Expected behavioural outcomes

The pupil will be able to:

— recall the importance of removing extra teats;
— identify the extra teats;
— carry out the operation of removing extra teas correctly

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Tick mark (✓) the correct answer

(i) Extra teats are removed at the age (6/12) months
(ii) Extra teats from the udder should be (snipped off/cut with a knife).
(iii) An antiseptic has to be applied to the site of snipping (before snipping/before after snipping)

ACTIVITY UNIT 11

Castration of Male Calves

11.1 Instructional objectives

The pupil should be able to

— recall the reasons for castration;
— use different methods of castration;
— differentiate between castrated and non-castrated animals.

11.2 Relevant information

Why castration?

Castration is removal of the testicles, the glands that produce male germ cells. Castration is one of the most feasible means of controlling the reproductive ability of male cattle. Breeding by inferior bulls causes deterioration in the genetic potential of the progeny. Therefore, elimination of undesirable male calves that are not required for breeding through castration is commonly practised all over the world. In India, where other channels of eliminating inferior animals are not available, castration is perhaps the only means of checking indiscriminate breeding by scrub bulls.

Further, robust, docile bullocks can be developed by castrating male calves. Castrated animals can be more conveniently housed and handled. Castration also results in fineness of neck, specially in buffaloes, which facilitate the fitting of yokes. Castrated males are more docile and can be handled easily while ploughing or carting.

When to castrate?

Male calves are castrated when they are about one year old. The older the calf is, the more it suffers at the time of castration. Castration should be performed during the cold season, strictly avoiding the rainy season for fear of infection due to flys and vermin.

Principle of castration:

By castration, the spermatic cords of both testicles are crushed. This cuts off blood supply to the testicles due to which they gradually shrivel up. Thus, they no longer produce the male germ cells. Production of testosterone hormone in the testis is also stopped which makes the animal lose libido and become docile.

11.3 Precautions

— Make sure that the cord does not slip out while applying the castrator to the neck of the scrotum.
— Clamp only one cord at a time.
— See that there is no interference with the circulation of blood through the central portion of the scrotum.
— Castrate the calf at the proper age.

11.4 Materials required

1. Burdizzo castrator
2. Rope 10 m long
3. Antiseptic
4. Rope 1 cm thick and 1.5 cm long.

11.5 Procedure

— Cast the animal down and secure its feet together with a short rope.
— Work the spermatic cord to the side of scrotum, and then clamp the Burdizzo at

about 3-5 cm above the testicles and hold it for a second.
— Repeat this operation on the same cord at a location 1 cm below the first one.
— Repeat the same procedure on the other testicle.
— Point a little of antiseptic on the clamp impressions.
— Free the animal.

11.6 Observations

The pupil should carry out castration of the calves. He should observe the conditions of the testicles before castration and one month after castration.

Particulars	*Before castration*	*1 month after castration*
State of testicles		
Healing status		
Effectiveness of operation		

11.7 Expected behavioural outcomes

The pupil will be able to:
— recall the effects of castration;
— carry out the burdizzo method of castration properly;
— check the correctness of the method carried out by him.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick mark (✓) the correct answer.

(i) Castration helps in producing more vigorous/docile animal.
(ii) Castration is done in (winter/rainy) season.
(iii) Calves should be castrated at the age of (2/1) years.
(iv) In castration (both/one) spermatic cord is clamped at a time.
(v) Each spermatic cord is clamped (once/twice).
(vi) The testes of castrated males shrive up due to stoppage of (blood/nerve) supply.

ACTIVITY UNIT 12

Drying off Cows

12.1. Instructional objectives

The pupil should be able to:

— recall the importance of drying off cows;
— differentiate between various methods of drying off cows;
— carry out drying off of cows properly.

12.2 Relevant information

What is the dry period

The dry period is a 'rest period' for cows. A cow should be dry for a period of 6 to 10 weeks before the expected date of calving for four important reasons:

— to rest the organs of milk secretion;
— to let the nutrients in the feed be used in developing the fetus instead of producing milk;
— to enable the cow to replenish in her body the reserves of minerals which have become depleted through milk production;
— to permit her to build up a reserve of body flesh before calving.

Cows that are denied a dry period will give less milk in the following lactation than those allowed a period of rest.

Methods of drying off: Three methods of drying off cows are in vogue: (i) incomplete milking; (ii) intermittent milking; and (iii) complete and sudden cessation.

(i) Incomplete milking: In this system, all the milk is not removed from the udder at milking time for a few days. Later, milking is done intermittently but never completely. As the production decreases to only a few litres a day, milking is stopped.

(ii) Intermittent milking: Under this procedure, the cow which is to be dried off will be milked once a day for a while, then once every second day and finally milking will be stopped altogether.

(iii) Complete and sudden cessation: This method is safe with cows producing as much as 10 litres of milk per day. If milking is stopped suddenly in this method, the udder fills until pressure increases enough to stop further secretion inside the udder. After the cessation of secretion, the milk is gradually re-absorbed from the gland until it becomes completely dry. The cow should not be milked during the stage of re-absorption as this releases the pressure within the gland and secretion is again initiated, which may prolong the period of drying off. This abrupt cessation of milking is best if the udder is sound and there has been no mastitis infection.

Length of dry period:

The cows with less flesh should have longer dry periods than those that have more flesh. For low producers, the dry period should be shorter. It is suggested that the dry period should be 6 to 10 weeks. The drying off process of cows is more a problem in exotic cattle and crossbred cattle which are high

yielders. In Indian breeds of cattle and buffaloes it may not be necessary to attempt drying off, as they normally dry off after short lactations.

12.3 Precautions

— Avoid milking cows during the stage of re-absorption in the complete and sudden cessation method of drying.
— Decide when to dry off a cow by judging her physical condition.

12.4 Materials required

1. Records of expected date of calving
2. Milking pail
3. Water for washing
4. Cloth
5. Collodion

12.5. Procedure

Identify the cow to be dried off with the help of the expected calving date record.

1. Incomplete milking:

— Do not remove all the milk from the udder at milking time for three to four days.
— Milk intermittently but never completely.
— Stop milking completely when production is decreased to only a few litres.

2. Intermittent milking:

— Milk the cow to be dried off once a day, for three to four days.
— Milk on alternate days for the next week.
— Finally, stop milking altogether.

3. Complete and sudden cessation:

— Remove all concentrates from the ration from 3-4 days before the drying off period begins. The reduction in feed will reduce the milk flow.
— Stop milking abruptly one morning.
— Wash the teats and dip in collodion after the last milking, which seals the teats orifices and thus prevents infection.

12.6 Expected behavioural outcomes

The pupil will be able to:

— realize the importance of drying off cows;
— select the appropriate method of drying;
— practise the drying of cows independently.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Tick mark (✓) the correct answer

(i) If cows are milked till the date of calving, yield in next lactations is _____ (reduced/increased).
(ii) The best method of drying off is _____ (complete and sudden cessation/intermittent).
(iii) Collodion is used to prevent (infection/milk) entering the udder.
(iv) Drying off is equally important in (Indian/exotic) breeds of cattle).

ACTIVITY UNIT 13

Feeding Dairy Animals

13.1 Instructional objectives

— recall the importance of feeding;
— identify the common feeds used for feeding;
— prepare different rations;
— organize feeding different categories of animals;
— calculate the economics of different rations.

13.2 Relevant information

Why feeding:

Feeding is the act of providing a balanced ration to the animals which contains all the essential nutrients needed for the preservation of life. Feeding is the most important and costliest operation on the dairy farm. Water, proteins, carbohydrates, fats, minerals and vitamins are the well recognized feed nutrients. They are to be ingested by the animal mainly for the following purposes.

— For repairing wear and tear of the body or the maintenance of the body.
— For the synthesis of the body tissues i.e. growth of the animal.
— For serving as a source of energy for vital processes in the body, growth, work or production.
— For generating heat necessary for maintaining body temperature.
— For serving as raw materials for the production of milk.

Common feeds and fodders:

Feed is any ingredient or material, fed to animals for the purpose of sustaining them. The number of feed stuffs is so great that it is impossible to cover each of them at this point. They are classified as:

1. Roughages: These are bulky feeds that are low in weight per unit volume, contain more than 18 percent crude fibre, and are low in energy, e.g., grass, green fodder, straw.

2. Concentrates: Concentrate feeds (not including protein supplements) are those which are high in energy and low in fibre (under 18 percent) and which contain less than 20 percent protein, e.g. grains, brans, oil cakes.

3. Feed supplements: These are feeds that are used to supplement some particular nutrients like proteins, minerals, vitamins, etc.

Essentials of feeding dairy animals:

Throughout the year, use economical, well balanced rations, which provide the nutritional requirements. Under feeding for a short period takes the cow a much longer time to come back to her normal production.

— Adjust the amounts of concentrates for each cow as per her actual production.
— Provide palatable rations, with plenty of good roughage and a seasonable variety of feeds.
— Use feeding stuffs that are slightly laxative rather than constipating.
— While introducing a change in ration, do it gradually so that the animals can adjust to the change.

— As far as possible, provide succulant green feed in the ration.
— Grind and soak the grains given in the concentrates. This increases their digestibility.
— Make plenty of fresh water conveniently available to cattle all the time, especially in summer.
— Provide adequate quantities of salt and mineral mixture.

Nutritional requirements of cattle:

Animals use their ration for two purposes viz. maintenance and production.

Production can be milk production, growth, work, etc. Nutritionists have studied the requirements of different nutrients by animals for various purposes. These requirements are tabulated and are given in all standard books on nutrition. The pupil should refer to them while computing rations and formulating feed compounds.

Factors determining quality of rations:

A good ration for animals should be palatable, made of a mixture of different feeds, reasonably bulky, adequately balanced and economical.

Composition of rations:

The composition of the mixture would depend mainly upon the region, and the availability of feeds and their prices. Ordinarily, a good concentrate mixture should contain one part of crushed grain, two parts of bran or husk and one part of oil cake. About 30 g of common salt and mineral mixture may be added to a daily ration. Some common concentrate formulations are given below:

1.	Wheat bran	50
	Oil cake	30
	Gram	20
2.	Gram	35
	Guar	15
	Rice bran	15
	Oil cake	35
3.	Tapioca	25
	Gram	25
	Oil cake	25
	Rice bran	25
4.	Oats	30
	Gram	40
	Oil cake	20
	Wheat bran	10
5.	Brewer's yeast	20
	Wheat/rice bran	30
	Maize/Tapioca	20
	Gram	30
6.	Barley	30
	Oil cake	20
	Wheat bran	30
	Gram	20

13.3. Precautions

— Always remove all stale grains and fodder from the manger before new feed is served.
— Give the largest feed of the day when the animals are resting.
— Make changes in the diet gradually
— Give coarse fodder and roots in chopped form so that they may be more efficiently utilized.
— Feed concentrates according to the requirements.
— Never over feed calves. Give just what is readily taken and no more.

13.4 Materials required

1. Facilities for feeding:

(i) Manger or feed troughs
(ii) Weighing balance
(iii) Feed measures

2. Different feeds and fodders

(Roughages)

(i) Non-eguminous dry fodder: rice straw, wheat straw, jowar straw, oat straw, jowar hay
(ii) Non-leguminous green fodders: *Jowar* fodder, maize fodder, bajra fodder, oat, guinea grass, napier grass, Sudan grass
(iii) Leguminous dry fodder: *Berseem* hay, lucern hay, groundnut hay, cowpea hay
(iv) Leguminous green fodders: Berseem, lucern, *guar,* lobia, pea

3. Concentrates:

(i) Grains: cereals, millets and legumes
(ii) By-products of grains, etc. : wheat bran, rice bran, oat bran, gram chuni
(iii) Oil cakes : cotton seed cake, linseed cake, groundnut cake, mustard cake
(iv) Animal products : Fish-meal, bone-meal, blood-meal.

4. Other feeding materials

13.5. Procedure

1. Feeding young calves:

— Feed the new-born calf on colostrum for four to five days. If it is not available, feed the calf with whole milk adding to it a little castor oil, cod liver oil and the white of an egg.
— Feed the calf at regular intervals (Up to a month the calf requires about 3 litres of milk a day. Later, this can be replaced gradually by skimmed milk until the age of 24 weeks).
— When the calf is two to three weeks old, let it begin to nibble at hay. Seed that the hay provided is of good quality. Do not give silage till the calf is at least two months old, otherwise it is likely to get scours.
— Allow the calf to have access to concentrates, when it is two to three weeks old. Gradually, increase the quantity to 500 g per day at the age of two months to about 750 g of concentrates per day at the age of about six months. The following table can serve as a guideline for good calf feeding.

TABLE
Feeding schedule for calves

Age (days)	*Colostrum feeding (kg)*	*Milk feeding (kg)*	*Calf starter (kg)*	*Legume hay (kg)*
0-4	2.5	—	—	—
5-7	—	2.6	—	—
8-15	—	2.8	0.1	ad lib
16-21	—	3.0	0.2	—do—
22-28	—	3.2	0.25	—do—

Age (days)	*Colostrum feeding (kg)*	*Milk feeding (kg)*	*Calf starter (kg)*	*Legume hay (kg)*
29-60	—	3.8	0.50	—do—
61-65	—	1.8	1.00	—do—
66-70	—	1.0	1.25	—do—
71-90	—	—	1.5	—do—
91-120	—	—	1.75	—do—
121-180	—	—	2.0	—do—

The calf starter should contain some animal source of protein and vitablend $AB_2 D_3$ @ 15 g per 100 kg mixture.

Ingredient composition of calf starter

Ingredient	*Kg/100 kg mixture*
Maize	42.0
Ground cake	35.0
Fish meal	10.0
Wheat bran	10.0
Mineral mixture	2.0
Common salt	1.00

Make salt licks available to the calf all the time, or add salt to the grain mixture. A calf requires about 30 g of common salt every day.

2. Feeding growing calves:

Follow the schedule given below for feeding growing calves. Estimate age by dentitions.

Age of calf (month)	*Green fodder (kg)*	*Dry fodder (kg)*	*Concentrate mixture (kg)*
6-9	5-10	Nil	1.5-2.0
10-12	10-15	1.0	2.0
13-18	15-20	1.0-2.0	2.5
19-24	20.25	1.0-2.0	2.0

Note:

(i) When forages like sorghum, *bajra* or their silage are available, full quota of concentrate mixture may be given.

(ii) Leguminous fodders, if available in plenty should be fed to fulfil the appetite of the animal and the amount of concentrate mixture can then be reduced to a minimum of 1 kg daily.

(iii) When green fodders are not available and straws/*kadbies* form the main roughage, 2-5 kg concentrate mixture should be given from 1 year onwards.

3. Feeding of pregnant heifers:

Feed of one kg of concentrate mixture, over and above their feeding schedule mentioned at 24 months of age, should be given during the last three months of pregnancy.

4. Feeding of pregnant cows and buffaloes:

Feed dry cows and buffaloes sufficient green fodders to maintain the body weight gain during the last quarter of lactation. The feeding schedule for such animals is as under.

Feeds	*Buffaloes*	*Cows*
Green fodder (kg)	30	30
Concentrate mixture (kg)	1.5	1.0
Dry fodder (kg)	ad. lib (5-6)	ad. lib (3-4)

5. Feeding of lactating cows and buffaloes:

(i) Feeding schedule when green fodders are not available

(a) Ration for maintenance of an animal:

(b) Ration for milk production:

— Follow the schedule given below:

Feeds	*Buffaloes*	*Cows*
Wheat bhusa (kg)	7-8	5-6
Green fodder (kg)	2	2
Concentrate mixture (kg)	2	1.5

— Feed 1 kg concentrate mixture for every 2 kg of milk production in the case of buffaloes

— Feed 1 kg of concentrate mixture for every 2.5-3.0 kg of milk in the case of cows.

(ii) Feeding schedule when green fodders are available

— Feed as per schedule given below:-

(a) Ration for maintenance of an animal :

— Feed chaffed green *jowar/bajra/*maize (wheat *bhusa* to satisfy the rest of the appetite)-25-30.

— Feed good quality green *berseem/*cucerne/ cowpea (wheat *bhusa* to satisfy the rest of the appetite)-15 kg.

(b) Ration for milk production:

Ration for maintenance mentioned above is to be supplemented for milk production depending on the quality of milk as follows:

Concentrate mixture as mentioned under (i) b above.

If plenty of good quality legume forages such as cowpea, berseem and lucerne are available then 8-10 kg of these forages can replace 1 kg concentrate mixture for milk production 7-8 kg of milk per day. For milk production above this level, the concentrate mixture should be added according to the scale mentioned in (i) b above.

6. Feeding bullocks

— Follow the feeding schedule given below :

Ration for a bullock doing normal work :

Concentrate mixture	1.5 kg
Green fodder	15.20 kg
Wheat bhusa/dry fodder	5-6 kg

Ration for a bullock doing heavy work:

Concentrate	2.5 kg
Green fodder	15-20 kg
Wheat bhusa/dry fodder	5-6 kg.

13.6 Expected behavioural outcomes

The pupil will be able to:

— Judge the quality of feed;
— adjust the fed according to production and availability of feeds;
— formulate rations for different stages of animals;
— recall feeds available in different seasons;
— determine the cost-benefit ratio of feeding.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick (✓) the correct answer

(i) Roughages contains more than 18 percent (crude fibre/protein).
(ii) Concentrates are high in (energy/crude fibre).
(iii) Berseem and cowpeas are (leguminous/non-leguminous) fodders.
(iv) Colostrum should be fed for the first (4/10) day.
(v) A calf does not eat roughage because rumen is (fully developed/not developed).
(vi) It is economical to base feeding dairy cattle on (green roughages/concentrates).
(vii) Concentrate mixture must contain (mineral/energy) supplement.

ACTIVITY UNIT 14

Study of Cattle and Buffalo Breeds

14.1 Instructional objectives

The pupil should be able to:

- identify the different breeds of dairy cattle and buffalo;
- differentiate between dairy characters, dual purpose qualities and draft characters
- judge the suitability of a breed for a specific agro-climatic situation;
- assess the status of a breed for economic benefits.

14.2 Relevant information

Dairy cattle and buffaloes are grouped into breeds. A breed is a sufficiently large group of animals developed by the efforts of man, members of which have a common ancestry and possess similar morphological, physiological and economic characters that are inherited. This implies that there is a continuous change in the breed characteristics in the direction of improvement. Cattle and buffalo breeds are classified in various ways. The classification may be based on their (i) zoological placement (ii) utility, (iii) phenotypic characters, (iv) adaptation to climatic situations.

The utility classification aims at the economic benefits that can be derived from the animals, such as milk production, draft capacity, and milk and draft both. All the Indian Cattle breeds belong to the *Bos-indicus* species. They possess a prominent hump and dewlap, whereas the exotic cattle breeds belongs to the *Bos-taurus* species. They are devoid of hump and have a relatively poorly developed dewlap. There are 26 breeds of cattle in our country. The mportant milch breeds are Sahiwal, Red Sindhi, Gir. Tharparkar, Deoni, Dangi, Kankraj, Haryana and are classed as dual purpose breeds. The draft type breeds are Khillari, Amritmahal, Kangayam, Malvi and others. The important milch buffalo breeds are Murrah, Nili-Ravi, Jaffrabadi, Surti, Maheswana, Berari. The important physical and economic characters of cattle and buffalo breeds are given below:

A. Milch Purpose Breeds

Breed	*Home tract and distribution*	*Physical characteristics*	*Economic characteristics*
1.	2.	3.	4.
i. Sahiwal	Dry central and southern parts of Punjab. Montgomary district in Pakistan. Good Sahiwal herds	Heavy breed, body symmetrical, broad head, thick and short horns, fine loose loose skin, forehead broad slightly bulging,	— Good dairy breed. — Milk yield-2270 kg. — Lactation-316 period days — Age at first calving

	are established in Punjab, Haryana, Delhi, U.P. and West Bengal, M.P. also.	hump massive, dewlap voluminous, sheath pendular, colour deep red to fawn with or without shed, ears medium and alertly carried, female quite docile, tail fine reaching to hock joint with black switch, male weighs 550 kg, and female weighs 410 kg.	41-52 months. — Calving interval of 15-17 month is observed. — Fat-5.2% — Bullocks are slow workers.
ii. Red Sindhi	Sindh province in Pakistan. Border districts of India. Good herds are established in almost all the States of our country.	Medium size animals, body compact and symmetrical with with well defined angularity, head medium, forehead broad and slightly flat, face proportionate to the size. ears alertly carried, skin of the ears coloured with yellowish tinge, horns medium thick, colour deep red often fawn colour with slightly yellowish tinge also seen, tail well set, weight male: 420 kg. female: 340 kg.	— Good dairy breed. — Milk yield-1727 kg. — Lactation 290 to period 317 days — Age at first calving 38-42 months. — Fat 4.6% — Inter calving period is 14.7 months.
iii. Gir	Gir forest. Around the area of Junagarh, Amreli, Bhavnagar. Good herds are seen in Maharashtra.	Medium type of breed, body well proportionate and with clean frame. forehead massive and evenly curved, horns curved, horns and bulging foreheads give a specific gait, eyes alertly alterly placed and prominent, eye-brows deep, colour varies from entire red to red with white patches, weight-male:·546 kg. and female: 386·kg.	— Cows are good milkers. Milk yield 1550 kg. — Age at first calving 51 months. — Calving interval 14-16 months. — Fat 4-5%
B. Dual Purpose Breeds			
i. Tharparkar	Arid and semi-desert areas of south east Sindh (Pakistan). Vicinity of of Thar deserts, Amarkot, Naukot, Dhoronars and Rann of Kutch.	Deep and stocky bodied animals, medium in size, straight limbs, head medium, forehead broad and flat slightly convex, ears slightly long and broad, colour of the skin inside the ear rich yellow, horns thick, colour white or gray, weight-male: 455 kg. and female: 365 kg.	— Cows are medium to good milkers. — Milk yield-1136 kg. — Age at first calving 43-49 months. — Inter calving period 15-16 months

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ii. Haryana	Rohtak, Hissar, Gurgaon, Karnal districts of Haryana.	Body proportionately built, and compact, head light and clean, face long and narrow, forehead flat to slightly convex, ears small and alertly carried, horns fine and short, colour white and in some cases greyish tinge seen on the forequarter, weight-male: 490 kg. and female: 350 kg.	— Dual purpose breed. — Males are good draft animals. Females are medium yielders. — Milk yield-1136 kg. — Age at first calving 40-52 months. — Calving interval 15-20 months — Fat% 4-5-4-6%
iii. Deoni	Udgir, Ahmadpur Nilanga, Latur talukas of Latur district of Maharashtra. Bidar district of Karnataka and border areas of Andhra Pradesh.	Body medium to heavy, forehead, prominent slightly bulging, Dewlap well developed, horns typically curved, ears pendulous, colour varies from white to white patches, Face often black and white patch on forehead, eyes bright, weight-male: 590 kg. and female: 340 kg.	— Dual purpose breed. — Males are good draft animal. — Milk yield 900-1200 kg. — Age at first calving 48 months — Inter calving period 15-16 — Fat-4.6%
iv. Kankraj	South-east of Rann of Kutch, Dessa, Radhanpur, Banas Kantha and Sabarmati basin in Gujarat State.	Heavy breed with "Swai Chal" (1 to 1¼ pace), Forehead broad and dished, face short, eyes bright, ears long, proportionately broad with reddish or brownish skin, horns thick growing slightly outward-upward and turning slightly inward towards the body, colour silver gray, weight-male: 590 kg and female: 430 kg	— Cows are fairly good milkers. — Milk yield-1100 kg. — Age at first calving 47-52 months — Calving interval 16 months — Fat 4.5%
v. Dangi	Dang and Surat districts of Gujarat State. Western Ghats of Maharashtra State State i.e. Nasik Thane and Ahmadnagar districts.	Thick-boned with well built body frame, skin loose, head usually small slightly bulging, eyes bright and prominant, ears short and black from inside, horns short and thick, colour white with irregular black patches, weight-male: 410 kg. and female: 300 kg.	— Good draft purpose breed. — Milk yield 550-680 kg. — Age at first calving 55 months — Calving interval 17 months — Suitable for heavy rainfall areas.
C. Draft Purpose Breed			
1. Khillari	Aungh, Jath, Satara,	Compact and light-bodied	— Good draft

	Sangli of Western Maharashtra, and Sathpura range, of Khandesh i.e. Jalgaon and Dhulia Districts.	animal, body cylindrical in shape, stout and strongly set limbs, head long and narrow, forehead bulging with a distinct groove in the centre, horns long, curved backward, upward and slightly forward.	purpose breed. — Milk yield 300-400 kg. — Bullocks are highly valued. — Draft capacity is good with fast speed. — Age at first calving 51 months. — Inter calving period 15 months

D. Exotic Milch Purpose Breeds

i. Holstein Friesian	Holland	Head medium ruggedly built, thighs straight, with slightly rounded withers, colour black with large irregular patches, perfect angularity carrying all dairy characters, large feeding capacity. weight-male: 1000 kg. and female: 675 kg.	— Cows are heavy yielders. — Milk yield 6150 kg. — Age at first calving 32-36 months — Inter calving period 14 months — Fat-3.6%
ii. Jersey	Jersey Island in English Channel.	Body proportionate with typical angularity, straight top line typical characteristics of the breed, levelled rump and sharp head withers, proportionate with a dish shaped, face colour fawn with or without markings, weight-male: 675 kg and female: 450 kg.	— Cow are heavy yielders. — Milk yield-4000 kg. — Age at first calving 32-38 months — Fat 4.7-5%
iii. Brown Swiss	Switzerland	Body not angular as is seen in other exotic breeds, head large usually dish-shaped, skin thick but loose, colour brown with dark shade, horns whitish in colour, weight-male: 900 kg female: 625 kg.	— Cows are heavy yielders. — Milk yield-5250 kg. — Age at first calving 38 months. — Fat-4.1%

E. Milch Purpose Buffalo Breeds

i. Murrah	Punjab, Haryana, Delhi and border areas of Rajasthan adjoining to Haryana and	Deep massive frame with light neck and head, horns short and light curved, colour jet, black, ears small, thin and	— Buffaloes are good yielders. — Milk yield 1800-2500 kg — Age at first

	Punjab. Good specimens are found in Rohtak and Gurgaon districts of Haryana State.	pendulous, skin soft, pliable, weight-male: 567 kg. and female: 430 kg.	calving 42 months — Calving interval 495 days — Fat 7.0%
ii. Nili-Ravi	Montgomary area of Pakistan. Ferozepur in Punjab and adjoining areas of Rajasthan. Best specimen are found in Sutlej Vally, Pakpattan, Multan Tehsil in Pakistan.	Body medium sized with deep frame, heavy head, bulging at the top and depression between eyes, muzzle fine, horns small and highly coiled, neck long, thin and fine, colour black with white marking on face weight-male: 567 kg and female: 454 kg.	— Buffaloes are good yielders. — Milk yield-1855 kg — Age at first calving 53 months — Calving interval 461 days
iii. Mahesana	Northern parts of Gujarat, Mahesana, Palanpur, Dessa, Banaskantha District.	Body medium sized with deep frame, head resembles that of Murrah, horns may be sickle-shaped or curved, colour black, neck long and fine, weight-male: 567 kg and female: 431 kg.	— Good milk yielders. — Milk yield-1400 kg. — Age at first calving 48-52 months — Calving interval 16 months
iv. Surti	Kaira district and adjoining areas of Gujarat State. Baroda, Sabarmati, Nadiad, Anand and adjoining areas have the best specimens.	Body compact with fine angularity, eyes bright, horns medium length with sickle shape curve, colour brown with two white collars below the necks, weight-male: 690 kg and female: 590 kg.	— Buffaloes are good yielders. — Milk yield-1725 kg. — Age at first calving 44 months — Inter calving period 16 months — Fat 7.5%
v. Berari	Nagpur, Wardha Yeotmal districts of Maharashtra State.	Body medium sized, horns long and flat with sword shape curve, neck long, limbs fine light, colour black, occasionally white patches on face also seen, weight-male: 522 kg. and female: 408 kg.	— Milk yield 522 kg. — Age at first calving 55 months — Calving interval 429 days — Fat-7.5%

— Physical and Economic Characterstics/and their Calculation/definitons:

a. Body Weight

i. Body weight of Haryana cow in kg = 3.3 (Chest girth in cm) + Posterior growth in cm) + 0.7 (Length in cm)-490

ii. Body weight of Buffaloes in (lbs) = 25.156(Y)-960.232
X = Estimated body weight in lbs
Y = Heart girth in inches.

b. Milk yield = simple average of milk yield in different lectations of various animals in a breed.

c. Inter-calving period = The period from date of calving to the date of subsequent next calving.

d. Age at first calving = Period from the date of birth of female calf to the date when she ds her first calf.

14.3 Precautions

— Be specific while describing the class of animal/animals (exotic/indigenious)
— Remember the typical characters of the breeds correctly.
— Do not confuse a particular character in one breed with the same character in another, some of the characters differ very minutely.
— Be sure that you have correctly spelled out/described the character.

14.4 Materials required

1. Live specimen of the breed (cow/buffalo)
2. Pegs,
3. Rope.
4. Photograph or coloured slide of a typical specimen.
5. Neatly drawn and correctly labelled diagram of the animal.
6. Model of the animal.

14.5 Procedure

— Get a typical specimen of the breed.
— Secure the specimen with pegs and rope.
— Make keen observations of each and every part of the animal.
— Study the physical characteristics of the animal and note the same.
— Identify the breed on the basis of the character.
— Check the character with the photo copy, slide or model or diagram of the animal.

14.6 Expected behavioural outcomes

The pupil will be able to:

— identify correctly the breed characteristics;
— differentiate correctly between the manifestation of the same character in different breeds;
— select the desired breed specimen from the herd.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Tick (✓) the correct answer.

(i) Humpless cattle belong to *Bos-taurus*/*Bos-indicus*/*Bos-bubalis* group.

(ii) Indian cattle breeds are classified on the basis of their productivity/home tract/utility.

(iii) A dairy cow should possess angularity/cylindrical frame.

(iv) Ideal specimens of Surti buffaloes can be had from Nadiad/Palanpur/Surat.

(v) The home tract of Murrah is Haryana/Punjab/Montgomary.

(vi) The body of Sahiwal. Cattle is loose/compact/fine.

(vii) Red Sindhi cow produce milk containing 4.5%/3.5% fat.

(viii) The age at first calving is an important characteristic to decide the economic viability/draft capacity/utility of an animal.

(ix) Calving interval governs the economics of milk production/butter fat production in cattle.

ACTIVITY UNIT 15

Judging Dairy Animals by Score Card Method

15.1 Instructional objectives

The pupil should be able to:

- recall the importance of judging dairy cattle;
- explain the significance of the score card method in judging the cattle;
- judge dairy cattle using the score card method;
- realize how close the cows being judged are to the ideal dairy type.

15.2 Relevant information

It has been found that certain physical characteristics are associated with high production. An understanding of these characteristics makes it possible to judge the productive potential of an individual in the absence of production records.

Judging of dairy cattle is a process by which ideal dairy animals are identified from a group. Different methods are employed for judging dairy cows such as, body conformation, score card and comparative evaluation. Among these, the score card method is more extensively used. A score card is a very useful tool for rating and selecting cattle through physical appearance. The score card lists all the characteristics of cows. It also contains scoring information which can help to evaluate the relative merit of each of the body parts of the cow. The score card method is based on the fundamental concept that all good dairy cows have certain common characteristics that are more basic than their shape, colour, size and other breed characteristics that are more basic than their shape, colour, size and other breed characteristics. The breeders too emphasize the same general dairy refinements. The score card is developed by the Dairy Cattle Associations. The score card spells out clearly the points to be allotted under various categories. The form of score card used for judging dairy cows is as under:

Score card for judging of dairy cows:

Scale of points	*Perfect score*	*Students score*		
		A	*B*	*C*
General appearance: 20 points				
Breed-confirming to the breed characteristics, stature, type, colour, shape, size:	4			
Build-well grown for its age.	2			
Appearance-clean-cut with feminine appearance, absence	3			

Scale of points	*Perfect score*	*Students score*		
		A	*B*	*C*
of tendency to lay on fat.				
Form-angular, 3 wedge form (period of lactation to be considered	5			
Quality-skin-thin, mellow and pliable; hairs-fine silky; bone-fine and refined.	4			
Temperament-alert, docile and refined.	2			
Head and Neck: 10 points				
Head-clean cut.	1			
Forehead-broad between eyes.	1			
Face-clean-cut of medium length.	1			
Muzzle-broad, moist, strong lips, nostril-large and wide opening. Jaws-strong.	2			
Ear-typical of the breed, well-carried with fine texture.	1			
Eyes-large and bright.	1			
Horns-fine, typical of the breed.	1			
Neck-long, fine and clean at junction with head, smoothly joining.	2			
Forequarters: 6 points				
Shoulders-blending smoothly into the neck, broad at the base and full at sides, running a wedge at top.	3			
Legs-straight, well set, apart, fine bones and clean feet.	2			
Body: 15 points				
Chest-deep, wide, broad between forearms.	4			
Back-straight and strong but not arched.	2			
Loin-broad, strong, leveled, and free from flesh, vertebrate well defined.	3			

Scale of points	*Perfect score*	*Students score*		
		A	*B*	*C*
Ribs-long, wide apart, deep and well sprung.	4			
Flank-deep and full.	1			
Naval flap-according to the breed characteristics.	1			
Hindquarters: 14 points				
Hip bone-clean and wide apart.	2			
Rump-long, wide and levelled.	3			
Pin bone-wide apart.	2			
Tail-well set, long fine gradually tapering and ending into a fine switch.	2			
Thigh-thin, long incurring but not round with escutcheon well defined.	3			
Hindlegs-straight, clean, well apart, fine bone, clean feed.	2			
Memmary Development: 35 points				
Udder shape-extending well forward well up behind. Quarters uniform and not deeply firmly attached, with symmetry.	7			
Capacity-large in size.	7			
Quality-pliable, free from lumps and fibrous tissue.	7			
Veins on the udder-prominent branching.	3			
Teats-convenient, uniform size and squarely placed.	5			
Milk veins-large, long, crooked and branching.	4			
Milk well-large numerous.	2			

Placing according to the score card as given below:

	First class	Second class	Third class	Fourth class

Student's placing score:
Teacher's placing score:

Disqualifications and discriminations:

While judging, the animal is also observed for certain defects that make its score negative. The defects are two types: (i) Disqualifications — defects that interfere with the life and production of the animal; (ii) Discriminations-defects of various intensities that reduce the value of the animal without interfering with its life or production. Animals with disqualifications can never win a prize. Appropriate points are deducted from the score card due to discriminations. The common disquaifications and discriminations are as follows:

(i) Disqualifications:
(a) Total blindness
(b) Permanent lameness
(c) Blind quarters and teats
(ii) Serious discriminations
(a) Wry face
(b) Parrot jaw
(c) Body winged shoulders
(d) Abnormal tail setting
(e) Bucked knee, blemished hocks, crooked hindlegs, weak pastern extreme toeing out in rear, body bowed pasterns, spread of toe.

Class of animal

It means a group of animals of the same breed, sex, age and production status.

15.3 Precautions

— Study the score card carefully and have a clear understanding of each characteristic or point of scale before going for judging.
— Get an ideal and clean picture of the class/breed of the animal in your mind and always compare all the body parts/characteristics, with standard/ideal characteristics of the breed/type.
— Use comparative and descriptive terms while giving reasons; avoid using vague terms such as good, better and best.
— Do not pay attention to what you overhear, others say about a class of animal. Be an independent judge with confidence.
— Do not give wordy and meaningless reasoning.
— Do not place animals on the basis of small relatively unimportant characteristics.
— Keep the animal moving in the judging ring.
— Examine the various body parts of the

animal from a distance of 3 to 4 m carefully.

15.4 Materials required

1. Blank score cards
2. Ropes
3. Halter
4. Judging ring (7 radius)
5. Pegs
6. Labels

15.5 Procedure

— Secure the animal with a halter and rope.
— Note the labels indicating the identity of the animals.
— Direct the attendant handling the animal to take it into the screening yard.
— Screen out the animals with major defects.
— Allow the competing animals into the judging ring.
— Let the animal get accustomed to the judging ring environment.
— Direct the attendant to ensure that the animal walks around the ring. Let the animal take two-to-three rounds.
— Carefully examine the physical characteristics of the animal while it goes around.
— Examine the movement and temperament of the animal.
— Start evaluating the body parts of the animal in the sequence given in the score card.
— Allot points to each of the body parts carefully.
— Get the total score and place the individuals on the basis of the total score.
— Place the animals in the order of the total score obtained which also reflects their merit as followed by the next highest and so on.

15.6 Observations

The pupil should give rating to the animals on the basis of total score obtained for the purpose of final score.

Identification No., of the animal	*Total score obtained*	*Position**
1		
2		
3		
4		

Denote the position in Roman letters, i.e. I, II, III and IV.

15.7 Expected behavioural outcome:

— The pupil will be able to:
— recall the importance of score card method
— carry out judging by the score card method;
— do the gradation on the basis of total merit of the animal correctly.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick (✓) mark the correct answers

(i) The udder of an ideal dairy cow is weakly/strongly attached to the body.
(ii) The quarters of the udder should be squarely/symmeteically placed.
(iii) The temperament of an ideal dairy cow is nervous/docile.
(iv) The back of an ideal dairy animal should be straight/arched.
(v) The skin of the udder should be pliable/rough.
(vi) A good dairy animal should possess a deep/narrow chest.
(vii) The milk vein should be prominent and crooked/small long.
(viii) The thighs of an ideal dairy cow should be incurving and flat/round and short.
(ix) The body of the dairy cow should be angular/cylinderical.

2. Fill in the blank

A. The nostrils of a dairy cow should be i)_____, ii)_____, iii)_____

B. The neck of a good dairy animal should be i)_____, ii)_____, iii)_____

C. The shoulders of a good diary animal should be i)_____, ii)_____, iii)_____

D. The legs of a good diary cow should be i)_____, ii)_____, iii)_____

E. The hib-bones of a good diary cow should be i)_____, ii)_____

F. The teats of a good dairy cow should be i)_____, ii)_____, iii)_____

G. The eyes of a good dairy animal should be i)_____, ii)_____

ACTIVITY UNIT 16

Study of Dairy Farm Records

16.1 Instruetional objectives

The pupil should be able to:

— recall the importance of record keeping on dairy farms;
— record the information in the registers;
— furnish detailed information on individual cows as well as on the entire herd;
— calculate the economics of dairying;
— evaluate past management practices;
— make long-range planning.

16.2 Relevant information

Importance of farm records:

Records are important documents containing scientific information on the events/ activies in respect of routine management of a dairy farm. The success of dairy farm business depends on how correctly and precisely the records are maintained. Complete and accurate records are the backbone of highly profitable dairying. The dairy farm records include information on production, reproduction, health, for each cow and the herd as a whole. In addition, they detail the information regarding income, expenditure profits and losses. Various kinds of records are maintained on dairy farms. For example, breeding records, calving records, health record growth records, production records feeds and feeding records, pedigree and performance records farm inventory, etc. The records should be self explanatory and simple in handling. The records are usually in the form of bound registers containing printed forms. The columns/rows of the form should be simple, meaningful and self explanatory. The last column or row is invariably meant for remarks. Some records are in the form of loose sheets, for example, the pedigree and history sheets of individual cows.

16.3 Precautions

— Avoid postponement in recording the information daily.
— Be accurate and sincere in recording.
— Avoid over-writing.
— Keep all the records in safe custody.
— Do not confuse while classifying the entries.
— Carryout cross-checking from time to time.
— Make permanent entries.

16.4 Materials required

1. Registers having printed forms.
2. Printed forms for loose records pocket diary.
3. Pen.
4. Stationery articles such as loose papers, pens, pencils.
5. Pocket diary - with date, day, year, time

16.5 Procedure

— Collect the transactions and events of the day and carry these to the office before 1 to ½ hours of closing of the farm.
— Transfer the information from your pocket diary or note sheet to the permanent register correctly with date and signature.

— Verify that the entries are done correctly in the specific register.
— Record cash transactions accurately. Check the entries and summations substractions, etc, before closing the registers for the day.

16.6 Observations

(i) The pupil should visit a dairy farm and study its dairy records.
(ii) The pupil should post the collected information in the following registers.

16.7 Calculation

The pupil should sum up the morning and evening milk yield for individual cows and for the herd and sum up the feeds, fodders issued in the morning and evening for individual cows and for the herd as a whole.

16.8 Expected behavioural outcomes

The pupil will be able to:

— express the importance of keeping records on farms;
— provide complete information about a chosen animal by referring to records;
— evaluate the monthly variation in the performance of the herd.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick mark (✓) the correct answer

(i) Records are the mirror/summary a business enterprise.
(ii) One may get misle if records are inadequately/incorrectly maintained.
(iii) The events of breeding, calving, deaths and disposal of animals are recorded daily/as they occur.
(iv) The date of birth, sale and disposal of calves ae recorded in the calf Register/Breeding Register.
(v) The sex of a calf is recorded in the Calf Register/Breeding Register.
(vi) Daily issue of feeds and fodders is recorded in Daily Feeding Register/Expenditure on Fodder and Feed.

Daily Milk Record

Month _____ *Year* _____

Sr. No.	*Date Cow/ No./Nome*	*1*		*2*		*3*		*4*		*28*		*29*		*30*		*31*		*Total*	
		AM	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*	*AM*	*PM*
1																			
2																			
3																			
Total																			

Cattle Breeding Register

Month _____ *Year* _____

Sr. No. Cow No.	Date of calving	Date of service	Time of service	Bull No.	Date of service	Time of service	Bull No.	Date of service	Time of service	Bull No.	Ist pregnancy diagnosis	2nd pregnancy diagnosis	Expecteu date of calving	Date to be dried off	Date of calving	Weight of calf	Sex of calf	Number of calf	Remarks
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Calf Register

Sr. No.	*Date of birth*	*Date of numbering*	*Ear No. of the calf*	*Sex of calf*	*Sire No.*	*Dam No.*	*Disposal*			*Remarks*
							Sold	*Kept for breeding*		
1										
2										
3										
4										

Daily Feeding Register

Date	*Number of cows, calves, bullocks etc.*	*Grain / concentrated feed (kg)*	*Straw or Hay feed (kg)*	*Greens feed (kg)*	*Remarks*	
1						
2						

ACTIVITY UNIT 17

Study of Dairy Animal Housing

17.1 Instructional objectives

The pupil should be able to

— recall the importance of housing.
— distinguish between the buildings generally present on a dairy farm.
— make plans for a dairy farm.

17.2 Relvant information

Why housing for dairy animals?

Proper housing for dairy animals is essential in order to protect them from wild beats, thieves, the sun, wind, rain and diseases.

Types of Housing:

There are, broadly speaking, two types of livestock houses viz. conventional barns and loose houses. Loose houses are most suited for our country.

Loose housing means keeping cows loose in an open paddock or pasture throughout the day and night, except at milking time. The open paddock is provided with shelter along one side under which the animals can retire when it is very hot or cold or during rains. A common watering tank is provided, fodder is fed in common mangers and concentrates are fed at the time of milking, which is done in a milking barn. The open paddock is enclosed by means of a half walls (1.5 m) or wooden or plain wire fences of convenient height. This type of housing is suitable for most parts of our country except in the temperate Himalayan regions and perhaps in the heavy rainfall areas. However, slight modifications of structure or use of extra fittings is often necessary to protect animals during extreme cold or hot seasons.

The loose houses are cheaper to construct, easier to expand and flexible in utility. Feeding and management of stock is easier in these because of common feeding and watering arrangements and animals are more comfortable as they can move about freely. Cows are milked in a separate milking parlour, so clean milk production is not a problem.

Buildings required on dairy farms:

The building units comprise sheds for housing different categories of animals and the necessary ancillary structures like stores, weighing yards, etc.

Milking barn:

This is a fully covered barn in which the milch stock are milked. In the barn there are either individual standings or stalls or stanchions in one row or two rows.

Double rows of standings can be arranged either tail-to-tail or face-to-face. Each standing can be used for two or three cows when hand milking is practised. The number of standings required on a farm are, thus, equal to half to one third of the number of milch cows. The floor is paved and has a slope of 1 to 40 towards the drains.

A small room is also generally attached to the milking barn which can be used as a milk-recording room and store.

Maternity pens:

Maternity pens or calving boxes are meant for keeping the pregnant cows two or three weeks before the expected date of calving. The number of these should be about 5 percent of the number of breedable female stock on the farm. These should be located near the residence of the farmer or the milking barn so that the down calvers can be constantly observed.

Calf shed:

Calf shed is meant for keeping the newly barn claf upto the age of 6 months. It should be located either at the end or on the side of the milking barn for taking calves to their dams quickly at milking time (if weaning is not practised). The floor should be of cement concrete in the covered area and brick-on-edge in the open area.

Young stock shed:

The young stock shed is meant for housing the older heifer calves from about six months of age to breeding age. Olders calves should be housed separately according to their age.

Sick animal shed:

This shed is more or less similar to the maternity pens in structure and located well away from the other sheds to make it inaccessible to healthy animals.

Bull sheds:

These are meant for housing the service bulls. There should be one shed for each bull, the number of bulls required being one for every 50 breedable females on the farm, if natural breeding is practised.

Shed for milch and dry cows:

These are single sheds comprising a covered portion and an adjoining open paddock. The covered area should be of cement concrete. Moorum flooring is quite good for the open paddock, though brick-on-edge floor is better.

Stores:

Stores are meant for storing feeds, hay, straw and equipment and are a must on dairy farms. The size and type of buildings for stores can be decided on the basis of the quality of feeds and fodders that are to be stored at a time on the farm.

Silos:

These are meant for preserving silage. These are of three types-tower. Pit and trench. In Indian conditions trench silos are more practical and convenient.

Milk house:

The milk house is an important part of dairy farm buildings. This is the place where the milk is collected, weighed and stored in cans for a brief period before delivery to milk plants. This should accommodate the milk recording equipment, milk cooling device in the form of bulk cooler, can racks, milking pail rack, sinks, washing outfit and furniture of the milk recorder. On very large farms the different components of the milk house i.e. recording-cum-milk cooling room, milk utensil and equipment room and washing room may be constructed as separate units. Doors and windows of the milk house should be made of fly, proof materials. The flooring of the room should be of cement concrete, impervious and reinforced with iron strips located at suitable distances to make it hard wearing. The walls should be lined with white glazed tiles up to a height of 1.5 m. A suitable platform of concrete slab (like that of a laboratory bench should be provided for keeping the milk testing apparatus.

Hay/straw sheds:

Hay/straw sheds meant for storing hay/straw. These sheds should be ready during the harvesting season, so that they can be stored through out the year. Adult stock consume about 6 kg dry fodder per day while young stock consume about 3 kg per day. The quantity of hay needed can be worked out on the basis of the number of days in a year when hay is required and animals. The hay shed should be away from the animal shed because of fire hazards. These sheds are simple structures with gabled roofs.

Space requirement:

1. Floor space requirements for different categories of dairy animals (Loose housing system).

Type of animal	*Floor Space (m^2)*		*Maximum number of animals per pen.*	*Height of shed (cm) at caves.*
	Covered area	*Open area/ paddock*		
Cows	3.5	7.0	50	175 cm in medium and heavy rainfall areas and
Buffaloes	4.0	8.0	50	220 cm in semi-arid
Down-calvers	12.0	12.0	1	and arid areas.
Young calves	1.0	2.0	30	
Older calves	2.0	4.0	30	
Bulls	12.0	12.0	1	

2. Feeding/watering space requirements tor different categories of animals.

Type of animals	*Space per animal (cm)*	*Total manger. length in a pen per 100 animals (cm)*	*Total water trough length in a pen per 100 animals*	*Width of manger water trough (cm)*	*Depth of manger water trough (cm)*	*Height of inner wall of manger water trough (cm)*
Adult cows & buffaloes	60-75	6000-1000	600-750	60	40	50
Calves	40-50	4000-5000	400-500	40	15	20

3. Approximate storage space (m^2) required per quintal of certain feeds.

Hay (loose)	1.60
Hay baled	0.70
Hay (chopped)	0.60
Straw (loose)	3.00
Straw baled	0.70
Bran	0.50
Grain and oilcakes	0.17

17.3 Precautions

— Plan a visit to a dairy farm, not very small in size, well in advance.
— Don't forget to carry necessary materials — pen, pencil, paper, etc.

17.4 Materials required

1. Facilities to visit a dairy farm
2. Tape measure
3. Drawing papers
4. Pens and pencils
5. Drawing equipment

17.5 Procedure

1. Study of existing farms:

— Collect notebooks, pencils, tape measure and drawing equipment if available.
— Visit a dairy farm with the above items.
— Note down the types and number of building on the farm.
— Measure the dimensions of each shed.
— Measure size and note placing of feed manger and water tanks.
— Count number of animals in each shed and note their category (calves, cows ..... so on).
— Record all other details.

2. Drawing plans for new dairy farm:

— Note the following:
(i) Quantity of milk to be produced per day on the proposed farm;
(ii) Number of cows to be maintained;
(iii) Breed/type of the animals to be maintained.
— Calculate the number of cows to be maintained on the basis of milk to be produced.
— Number of cows needed will be: quantity of milk to be produced daily (kg) divided by mean daily yield (kg) of the cows to be maintained.
— Add 30 percent more to the number of milch cows to arrive at total number of cows to be maintained.
— Number of milch cows = 50 + 30 percent = 15.
— Total cows required = 50 + 15 = 65.
— Arrive at the number of followers of the cows as follows:
— Number of calves below 1 year will be = total cows — 20 percent (less due to calf mortality) i.e. 65-13 (20 percent = 13) = 42, of which roughly 21 will be females and other males.
— Number of calves above 1 year will be = (Number of young calves — 10 percent (towards calf moratlity) i.e. 42-4 (10 percent = 4) = 38 of which 19 will be female and rest male calves.
— Calculate the required number of maternity pens (10 percent of breedable adult cows 65 = roughly 6.

— Calculate the required number of sheds for sick animals (5 percent of the total number of the farm animals (105) = roughly 5.
— Number of bull pens required (1 per 50 cows if natural service is carried out) = 1.
— Calculate space requirements for these animals as:

Class of animals	*No. of animals*	*Standard covered area required (m^2)*	*Standard open area required (m^2)*	*Total covered area required (m^2)*	*Total open area required (m^2)*	*Number of sheds*	*Maximum number of animals in each shed*
Milch cows	50	3.5	7.0	175	350	1	50
Dry cows	15	3.5	7.0	52.5	105	1	50
Calves older (above 1-Yr)	21	2	4.0	42.0	84.0	1	30
Calves young	19	1	2.0	19.0	38.0	1	30
Materinity pen	6	12	12	72.0	72.0	6	1
Milking barn	5	1.2×1.8	—	10.8	—	5 (stalls)	1 (in each each stall).
Bull	1	12	120	12	120	1	1

— Arrive at the number of accessary buildings according to feeds requirements i.e. for dry fodder 0.63^3 per quintal and for concentrate 0.25 m^3 per quintal.
— Calculate dry fodder requirements @ of 5 kg/per adult animal and 2 kg per older calves and 1 kg for young calves daily.
— Calculate concentrate requirements @ of 4 kg/per milch cow and 2 kg per dry cow and 1 kg per calf daily.
— Make ground plan for the dairy farm following these rules that young calf and milch cow sheds should be close to the milking barn.
— For guidance, study the given ground plan for dairy units of different size.

17.6 Observations

The pupil should visit a dairy farm and record the following:

Types of houses	*Number of houses*	*Number of animals kept in each house*	*Dimension of each house width (cm) length (cm)*	*Dimension of Manger and trough (cm) available*	*Orientation of Main-building*	*Facilities for Electricity Water-*

17.7 Expected behavioural outcomes

The pupil will be able to:

— recognize the different of houses;
— calculate the space and building requirements;
— make plans for housing different animals.
— the teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Tick mark (✓) the correct answers.

(i) Covered space required in a loose house for buffalo is 3/4/5 m2.
(ii) Dairy barns are more comfortable for temperate/tropical climate areas.
(iii) The maximum number of calves that can be kept in a house is 50/30/100.
(iv) The open paddock of a loose house is enclosed by (3 m/4 m/1.5 m) high walls.
(v) Cows are more comfortable in a barn/loose house.

2. Name the different types of dairy animal houses.
3. Write down three advantages of the loose housing system.
4. What are the important considerations for making a good animal house?

ACTIVITY UNIT 18

Cleaning and Sanitation of Animal Sheds

18.1 Instructional objectives

The pupil should be able to:

- appreciate the importance of a clean and healthy environment in the animal sheds;
- recall the effectiveness of different cleansing and sanitation materials used in the cleaning operation;
- be familiar with various methods of cleaning.
- clean and sanitize the animal shed.

18.2 Relevant information

Why cleaning and sanitation of animal houses?

This is necessary for elimination of all micro organisms that are capable of causing disease in the animals. The presence of organisms in the animal shed contaminates the milk produced, thus reducing its shelf life. Milk produced in an unclean environment is likely to transmit diseases which affect human health. Dry flooring keeps the hooves dry and protects from foot injury.

Similarly, the presence of flies and other insects in the dairy farm area are not only disturbs the animals but also spreads deadly diseases to the animals e.g. Babesiosis, Theileriosis.

Cleaning:

The easy and quick method of cleaning an animal house is with the liberal use of tap water, proper lifting and disposal of dung and used straw bedding, providing proper drainage to the animal house for complete removal of liquid waste and urine. The daily removal of feed and fodder left over in the manger, reduces the fly nuisance. Periodical cleaning of water throughs eliminates growth of algae and bacterial and viral contamination and thus keeps the animals healthy.

Sunlight is the most potent and powerful sanitizer which destroys most of the disease producing organisms.

Sanitizers:

Disinfection of animal sheds means making these free of disease producing bacteria and is mainly carried out by sprinkling chemical agents such as bleaching powder, iodine and iodophor, sodium carbonate washing soda, slaked lime (calcium hydroxide) quicklime (calcium oxide) and phenol.

Bleaching powder:

This is also called calcium hypochloride. It contains upto 39 percent of available chlorine which has high disinfecting activity.

Iodine and Iodophor:

This is commercially available as iodophores and contains between 1 and 2 percent available iodine which is an effective germicide.

Sodium carbonate:

A hot 4 percent solution of washing soda is a powerful disinfectant against many viruses and certain bacteria.

Slaked lime and quicklime:

White-washing with these agents makes

the walls of the sheds and the water troughs free from bacteria.

Phenol:

Phenol or carbolic acid is a very disinfectant which destroy bacteria as well as fungus.

Insecticide:

Insecticides are the substances or preparations used for killing insects. In order to control flies and disease transmitting ticks, insecticides are used in dairy farms. Ticks usually hide in cracks and crevices of the walls and mangers. Smaller quantites of insecticide solutions are required for spraying. Liquid insecticides can be applied with a power sprayer, hand sprayer, a sponge or brush.

Commonly used insecticides are BHC, DDT, Gamaxane Wettable powders, Malathion, Sumithion, Sevin 50 percent emulsifying concentration (EC) solution. These are highly poisonous insecticides and hence need to be handled carefully, and should not come in contact with food material, drinking water, milk, etc.

18.3. Precautions

— Remove dung and used bedding completely.
— Avoid spilling of dung and used bedding while carrying it out.
— Avoid the use of dirty water in cleaning animal sheds.
— Never put the fresh fodder over the previous day's left over fodder in the manger.
— Prevent algae to growth in the water troughs.
— Use proper concentration of disinfectant/ insecticide solutions to avoid any toxic effects or poisoning.
— Avoid use of disinfectants and insecticides at the milking time as milk absorbs odour quickly.

18.4. Materials required

1. Implements:

(i) Shovel
(ii) Floor brush
(iii) Coconut broom
(iv) Iron basket
(v) Wheelbarrow
(vi) Bucket
(vii) Hose pipe
(viii) Bullock cart
(ix) Brush for whitewashing
(x) Spray pump
(xi) Wall brush

2. Chemicals:

(i) Bleaching powder
(ii) Iodine and Iodophor
(iii) Sodium carbonate (washing soda)
(iv) Calcium hydroxide (slaked lime)
(v) Calcium oxide (quick lime)
(vi) Phenol

3. Insecticides:

(i) DDT/BHC/Gamaxane Wettable powder
(ii) Malathion/Sumithion 50 percent E.C.

4. Adequate water

18.5 Procedure

— Remove the dung from the floor and urine channel with the help of a shovel and basket (iron) and transfer it to the wheel-barrow.
Remove the used bedding and leftovers from the manager in a similar way.
— Empty the water trough and scrape its sides and bottom with the help of a floor brush.
— Wash the water trough with clean water and whitewash it with the help of lime

mixture once a week.
- Scrape the floor with a brush and broom and wash with water.
- Clean and disinfect the splashes of dung on the side walls, railing and stanchions.
- Remove the cobwebs periodically with the help of a wall brush.
- Sprinkle one of the available disinfecting agents like bleaching powder, phenol solution, washing soda, etc., in the following concentrations:
  Bleaching powder should have more than 30 percent available chlorine.
  Phenol (1-2 percent solution)
  Washing soda (4 percent solution)
- Allow adequate sunlight to enter the animal shed.
- Spray insecticides at regular intervals specially during the rainy season (fly season).
- Whitewash the walls periodically by mixing insecticides in it to eliminate ticks and mites living in cracks and crevices.
- Transfer the accumulated waste material from the wheelbarrow to the waiting bullock cart to be carried to the disposal site.

18.6 Observations

The pupil should observe the following

1. Cleanliness of the floor, mangers, railings etc. Yes/No
2. Presence of insects and pests. Yes/No
3. Presence of cobwebs. Yes/No
4. Presence of flies Yes/No

18.7 Expected behavioural outcomes

The pupil will be able to:
- realize the importance of cleaning and sanitation of animal shed;
- identify used for disinfection;
- carry out the cleaning operation and sprinkling of disinfectants in a scientific way;
- develop the habit of regular cleaning of sheds.

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. Why are cleaning and sanitation of animal sheds necessary?
2. How will you disinfect animal sheds?
3. Fill in the blanks:
   (i) Periodical whitewashing of water troughs prevents the growth of _____.
   (ii) _____ are controlled by insecticides.
   (iii) Sunlight is the most potent and powerful _____ which destroys microorganisms.
   (iv) _____, _____ and _____ are the common disinfectants used in cleaning and sanitation of animal sheds.

ACTIVITY UNIT 19

Grooming and Washing of Animals

19.1 Instructional objectives

The pupil should be able to:

— identify the materials used for grooming and washing;
— groom and animal to prevent skin diseases and detect injuries otherwise unnoticed;
— wash the animals;
— lead the animals to the nearby river or pond for wallowing.

19.2 Relevant information

What is grooming?

Grooming compromise brushing the haircoat of the animal. It is performed to remove the waste products of the skin, like skin secretion, loose hair and other skin parasites like lice, ticks, mites, etc. It stimulates the blood and lymph circulation of the skin. This helps to keep the animal clean and, thus, is an important operation in clean milk production. Regular grooming makes the hide pliable and shining and thus, increases its market value and beauty in judging competitions.

What is washing?

Washing of animals is also an essential daily operation for keeping the animals clean and comfortable. It makes the production of clean milk possible.

What is wallowing?

Wallowing means to roll about or lie in water, mud, etc., for pleasure. Buffaloes like wallowing in fresh water and they wallow in herds, in rivers, ponds and other water. When sufficient water is not available, specially in summer months, buffaloes lie in the muddy water to keep their body cool. Where wallowing is not posible, the buffaloes are washed once or twice, depending on the atmospheric temperature.

19.3 Precautions

— Avoid grooming wet animals.
— Avoid grooming the animal against the direction of hair flow.
— Avoid using a brush on the face and other sensitive areas.
— Avoid grooming the cows in the milking parlour and during milking.

19.4 Materials required

1. Curry comb
2. Body brush
3. Bucket
4. Hose pipe
5. Flannel/Khadi cloth
6. Rope
7. Animal (Bullock/Cow/Buffaloes)

19.5 Procedure

1. Grooming:

— Tie the animal in a clean area:
— Hold the brush in the left hand while grooming the left side of the animal and while grooming the right side, hold it in the right hand.

— Groom the body in a backward direction i.e. face to tail (towards tail along the fall of the hair).
— Groom the legs from top downwards.
— Give a twist to the wrist at the end of each sweep. This is given to bring out the dust and debris which the brush has collected.
— Clean the brush with the help of a curry bomb after each sweep.
— Wipe the face, eyes, nose and under surface of tail with a clean Khadi of flannel cloth.
— Groom thoroughly the hiding places of ectoparasites like the sides of the udder, below the ears, dewlap and around the navel.
— Use a curry bomb to remove dried dung and dirt by brushing against the direction of the hair.

2. Washing:

— Tie the animal.
— Brush the hind quarters with the body brush and wash with water.
— Pour water over the whole body coat so that the animal's hair coat gets wet.
— Rub the coat with hands or against the hair while pouring water.
— Use liquid soap over the body for show animals so that a rich lather is formed.
— Rinse off the lather thoroughly with water.
— Ensure that the body coat is dried thoroughly with towel cloth before milking

Note: Such at elaborate procedure is not neccesary for buffaloes as they need to be washed many times, specially in summer, as they have the instinct of wallowing.

3. Wallowing:

— Lead the buffaloes to the tank/river or pond.
— Follow the animals in the water for rubbing and cleaning the body.
— Use a body brush, if necessary.
— Ensure complete washing while wallowing by sprinkling water on face, ears and head.
— Clean the horns if they are soiled.
— Allow buffaloes to wallow for at least one hour a day.
— Wash the legs when the animals come out of the pond.

19.6 Observations

The pupil should observe thoroughness of the grooming operation by passing the fingers of the hand in the opposite direction of the hair so as to pass the tips of the fingers firmly against the coat. The absence of gray lines on the skin and the absence of gray scurf on the tips of the fingers indicates efficient grooming.

Observe the animal after washing to ensure that no dried dung and mud is sticking to the body, particularly around the udder and perineal region.

19.7 Expected behavioural outcomes

The pupil will be able to:

— realize the importance of grooming and washing of the animals;
— groom and wash the animals;
— realize the need of grooming and washing for clean milk production.
— understand the importance of wallowing in the case of buffaloes.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. What is grooming?
2. State the advantages of grooming.
3. List the materials used for grooming.
4. How will you clean the face and the portion below the tail of a cow?
5. How do grooming and washing help in clean milk production?
6. What is wallowing?
7. Tick (✓) the correct answer.

(i) Buffaloes should be washed twice or thrice in summer. Yes/No
(ii) Cows enjoy wallowing. Yes No.
(iii) Grooming helps in detaching ectoparasites. Yes/No

ACTIVITY UNIT 20

Wastes Disposal from a Dairy Farm

20.1 Instructional objectives

The pupil should be able to:

— recall the importance of proper disposal of wastes from the dairy farm
— identify the types of farm waste to be converted into useful manure;
— practise the various methods of waste disposal.

20.2 Relevant information

Why proper disposal?

Waste, if not disposed of properly, acts as an ideal breeding place for disease producing bacteria and also disease carrying insects, including flies. The proper disposal of waste and its conversion into useful manure preserves the important plant nutrients.

Types of Waste:

Dairy farm waste can be:

(i) Solid-dung waste, soiled bedding and leftover feed and fodders from the animal shed
(ii) liquid urine and floor washings

Ways of waste disposal:

Solid waste cn be disposed of by:

— Dumping in a manure pit.
— Mixing with wash water from animal sheds and then using for irrigation.
— Using for production of biogas.

Similarly, liquid waste disposal is done through drains to soakage pits or directly to fields for irrigation.

Manure pits:

When solid waste is collected separately, it should be done stacked properly in manure pits so that it gets well decomposed does not attract flies. The manure pit should be located as far away as possible from the animal house. This is necessary to prevent foul odour and fly menace. Flies affect efficient milk production, as they worry the animal jphysically as well as carrying infections diseases. Ideally, a manure pit should be at a minimum distance of 10 m from wells, rivers and tanks. Pits must be impermeable to water. The size and number of manure pits required depends on the production of dung on the farm which is on an average 40 kg per adult animal. One cubic metre of pit can hold 700-1000 kg of manure forstorage and cure.

Soakage pit:

When the quantity of liquid waste is small, the disposal can be done by drawing it into the soakage pit where it is absarbed. The accumulated solids of the soakage pits can be periodically removed and used as manure. When there is a higher number of dairy animals and there are facilities for the supply of plenty of water, the liquid waste can be drained to a liquid manure storage tank through an inspection chamber and a setting chamber as shown in *Fig. 20.2.*

Manure is the decomposed excreta and oher wastes from the animal houses which contains organic matter and nutrients which are essential for plants growth. Cattle dung

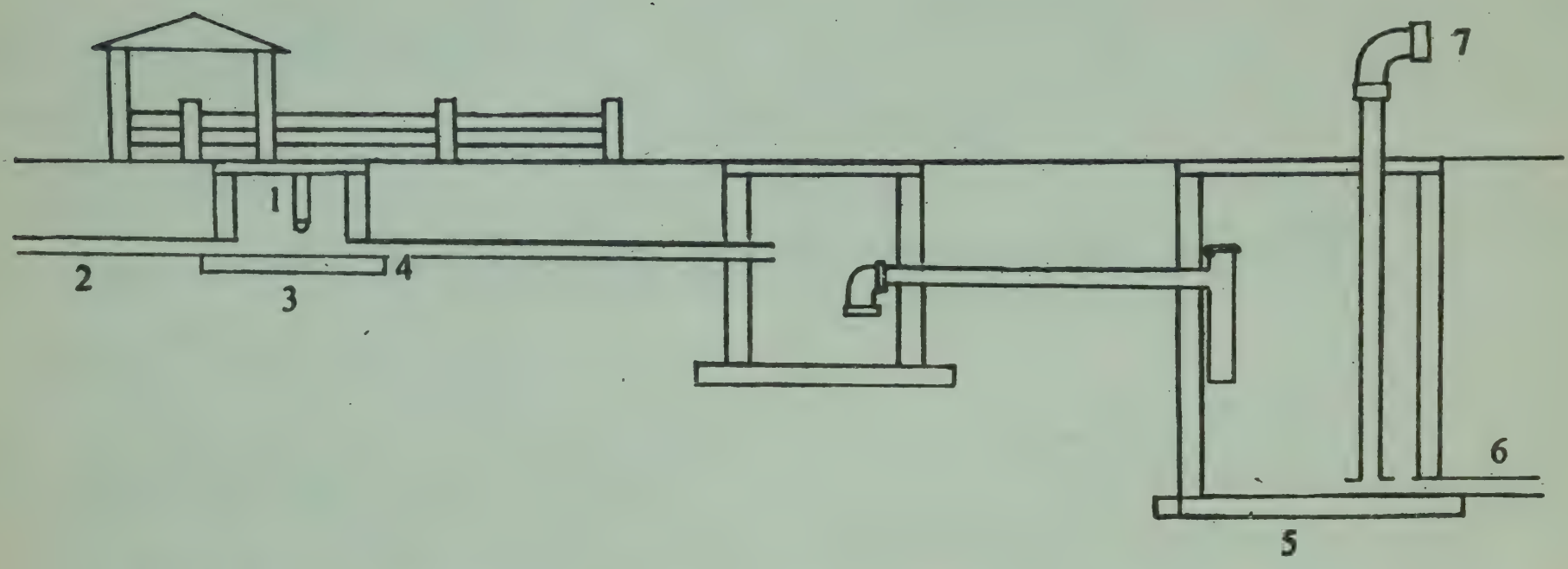

FIG. 20.2.1 DRAINAGE SYSTEM FOR CLEARING LIQUID MANURE FROM ANIMAL FARMS

1. DRAIN FROM A BUILDING OPENING INTO THE INSPECTION CHAMBER, 2. DRAIN FROM ANOTHER INDIVIDUAL BUILDING, 3. INSPECTION CHAMBER WITH A MAN-HOLD, 4. SETTLING CHAMBER, 5. LIQUID MANURE STORAGE TANK FOR THE WHOLE FARM, 6. OUTLET TOWARDS FIELDS (IN THE TANK IS LOCATED AT A HIGHER LEVEL), 7. OUTLET WITH PUMPING DEVICE (IF THE TANK IS LOCATED AT THE SAME OR AT A LOWER LEVEL).

has 77.5 percent water, 20.3 percent organic matter, 0.34 percent nitrogen, 0.16 percent phosphoric acid, 0.04 percent potasha and 0.31 percent lime.

20.3 Precautions

— Avoid spilling of dung while carrying it to the manure pit.
— Prevent entry of rain or drain water into the manure pit.
— Do not use a fresh pit unless the previous one is filled completely and properly covered with soil.
— Avoid overflow of the soakage pit and ensure its permebility.
— Never dig a manure pit near the dwellings and milking parlour.

20.4 Materials required

1. Implements:
(i) Shovel
(ii) Wheelbarrow
(iii) Bullock cart
(iv) Crow bar
(v) Iron basket
(vi) Soade
2. Manure pit
3. Soakage pit
4. Liquid storage tank (in large dairy farms
5. Adequate water

20.5 Procedure

1. Solid waste disposal

— Dig a manner pit of 4×3×2 m size.
— Collect the dung and other solid waste in wheelbarrows using a shovel.
— Carry the wheelbarrow outside the shed to the bullock cart and transfer the waste into it.
— Take the bullock cart to the manure pit/pits and empty the solid waste into the manure pit for decomposition.

— Cover the manure pit when it is full, with soil and firmly press the soil down.
— Leave it for decomposition until it is completely decomposed.
— Use another pit when the previous one is filled completely.
— Carry the dung to the biogas plant wherever available and mix it with water and use for biogas prduction.

2. Liquid waste disposal:

— Flush the urine, liquid dung and floor washing with water into the soakage pit.
— Drain the liquid waste to a liquid manure storage tank (in case of large farms).
— Lead thewash water directly to the fields if fodder is cultivated nearer the farm.

20.6 Expected behavioural outcomes

The pupil will be able to:

— realise the importance of proper farm waste disposal;
— differentiate between thedifferent types of farm wasts;
— dispose of the farmwastes suitably;
— preserve the manurial value of the dairy farm waste

The teacher should evaluate the pupil for the above abilities.

QUESTIONS

1. What are the advantages of proper disposal of wastes?
2. How many types of dairy farm wastes are available for disposal?
3. When do you use a manure pit and soakage pit?
4. Fill up the blanks
   (i) A manure is used for _____ wastes while a soakage pit is used for _____ wastes..
   (ii) One cubic metre manure pit can hold _____ kg of dung waste.
   (iii) _____ wastes are used for irrigating fields.

ACTIVITY UNIT 21

Recognition of Animals in Health and Disease

21.1 Instructions objectives

The pupil should be able to:

— differentiate between diseased and healthy animals;
— study various signs of ill health;
— familiarize himself with the normal activities of the healthy animal.

21.2 Relevant information

Signs of health and disease:

Livestock diseases cost farmers millions of rupees annually. They cause loss of production in milk and other products, deteriorate the body condition besides loss of animals due to death and disease. Sick animals require a lot of time to recover and also much money has to be spent for their treatment.

The symptoms shown by an animal help to ascertain whether the said animal is healthy or diseased. To recognize the signs of health and disease, it is necessary to observe the animal closely every day. Early detection of a diseased animal helps in rendering speedy treatment by which the animal can be brought back to health and its productivity restored This saves a lot of money and energy.

Important signs of ill health:

1. Position of limbs and body: A healthy animal stands with an easy appearance and walks freely without discomfort. An animal standing with its head down or showing undue weariness and staying apart from the rest of the herd, indicates disease. In the case of milk fever, the cow or buffalo draws back her head, forwards the udder and sits in a very unnatural position.

2. Appetite: Healthy animals eat greedily. Loss of hunger, stoppage of eating and rumination is an early warning of disease.

3. Skin texture: The skin of healthy animals is soft and elastic and the skin coat moves freely over the underlying muscle. A coarse and dry skin with dry and rough hair indicates the presence of diseases internally, or is due to external parasites.

4. Muzzle and nostrils: The muzzle and nostrils of healthy animals are moist, cool and free from any discharge. When the muzzle shows dryness, one can suspect disease.

5. Variation in pulse rate, respiration rate and body temperature: The normal body temperature, pulse and respiration rate of healthy cows and buffalo are as follows:

	Cow	*Buffalo*
Pulse	50-60 beats per minute	40-50 beats per minute
Respiration	20-25 per minute	15-20 per minute
Body temperature	38.6°C	36.8-39.4°C

In healthy animals the rate of the pulse, respiration and body temperature fall within the range of normal readings. When one notices a rise in the rates of the above, it is a sign of ill-health and the animal needs to be examined by a veterinarian.

6. Appearance of eyes: The eyes in healthy animals are bright and alert. Sunken eyes with a fixed staring look indicate the onset of fever. Tears from the eyes give an indication of irritation of the eyes or some disease. Trouble in one eye means a local trouble while discharge from both eyes indicates a systemic ailment.

7. Appearance of dung and urine: The dung of healthy cows and buffaloes is rich green in colour semi-solid, holds together, and is free from gas bubbles or blood clots. Too watery or too hard dung indicates digestive trouble which may be due to falty feed, parasites or some other disease.
Similarly the urine of healthy animals is clear and straw-coloured. In diseased conditions it becomes too dark or may have sediments and offensive odours.

8. Appearance of natural orifices: Evidence of foul discharge like pus from genital organs and tail soiled with dung indicate ill healthy of the digestive or genital organs.

9. Quality and quantity of milk: Blood, milk clots and whey like substance secreted through the teats is indicative of udder infection (mastitis).

21.3 Precautions

— Observe animals at least once daily for signs of disease.
— Make sure that the immediate cause of disease is not faulty feed, housing or other defects in management.
— Drive away stray dogs before examination and avoid other disturbances.
— Watch all animals individualy.

21.4 Materials required

1. Clinical thermometer,
2. Cotton rope
3. Iron/wooden trevis.
4. Animals

21.5 Procedure

Watch the animals from a distance of about 3-4 m.
— Do not disturb the animals or create excitement in them.
— Lead the animal showing abnormal behaviour to the trevis.
— Examine the animals gait carefully, while leading it.
— Secure the animal in the trevis.
— Pass the hand over the body from the neck to the tail region and examine the skin and hair coat and record the observations.
— Examine the muzzle and nostrils.
— Note the alertness and sharpnerss of the eyes and watch for any eye discharge.
— While being examined the animal generally passes dung and urine which may be noted and the observations recorded.
— Observe for any discharge from the vagina or soiled tail region.
— Examine the udder and teats and draw milk from each teat and record the observations.
— Record pulse and respiration rate.
— Record the body temperature with the help of a clinical thermometer and note

the pulse and respiration rate per minute.
— Isolate the animal for treatement if it is sick.

21.6 Observations

The pupil should record the following on at least five animals. Use notings like for normal moderate abnormality, real abnormality.

21.7 Expected behavioural outcomes

The pupil will be able to:

— recognize the signs of ill-health;
— differentiate the sick from the healthy animal;
— record the changes that occur in the body in ill-health condition;
— record the changes in body temperature, pulse and respiration rate;
— render quick first aid to sick animals.

The teacher should evaluate the pupil for the above abilities.

TABLE

Signs/record	*Animal Numbers*				
	1.	*2.*	*3.*	*4.*	*5.*
i. Posture (Position of Limbs & body)					
ii. Loss of appetite.					
iii. Skin texture					
iv. Muzzle & nostrils					
v. Eyes					
vi. Dung					
vii. Tail portion					
viii. Udder & milk					
ix. (a) Pulse					
(b) Respiration					
(c) Body temperature					

QUESTIONS

1. Answer the following questions in one or two sentences

(i) What is the importance of recognizing sick animal?
(ii) What are the common signs of ill health of the skin?
(iii) Describe the condition of the eyes of healthy animals.
(iv) What does discharge from the vulva indicate?

2. Fill in the blanks with the correct word

(i) _____ sick cow from the herd (Isolate/examine).
(ii) In a healthy cow, the pulse is recorded as beats per _____ (minute/animal).
(iii) The muzzle of a healthy buffalo is--------and moist (cool/red).
(iv) Loose, watery dung is a sign of trouble in _____ tract (digestive/infected).
(v) Normal milk indicates that the udder is _____. (healthy/infected).
(vi) Normal body temperature of a cow is _____ OC. (38.6 °C/34.6 °C).
(vii) Normal breathing rate of buffalo is------per minute. (15-20/20-25).

ACTIVITY UNIT 22

Recording Pulse, Temperature and Respiration

22.1 Instructional objectives

The pupil should be able to:

— recall the importance of recording pulse, temperature and respiration;

— record pulse, temperature, and respiration correctly of an animal is useful for:

22.2 Relevant information

— Verification of the health of animals,

— recording the reactions of animals to unfavourable climate.

— studying carly symptoms of disease if any and taking steps to prevent the spread of the disease.

Healthy cattle and buffaloes have a normal range of pulse rate, body temperature and respiration rate specific to the species. Any deviation from the normal values indicates ill-health or discomfort to the animal. Hence, the recording of pulse, temperature and respiration rate is necessary to know the health status of the animal.

Pulse rate: Pulse is the impulse of heart beat felt as a wave of expansion along the arteries. It is felt by feeling the superficial arteries lying over hard tissue. In cattle and buffaloes, the pulse can be felt easily under surface of the tail along the median line where lies the coccygeal artery.

Body temperature: The body temperature can be measured by inserting a clinical thermometer into the rectum of an animal and ensuring touching of the bulb to the rectal wall for one minute.

Respiration rate:

Respiration means taking fresh air in (inhalation or inspiration) dand givee off foul air out (exhalation or expiration) through the nose. One inspiration and one expiration costitute one respiration. The number of respirations per minute is known as respiration rate. Respiration rate can be recorded by the following methods:

(i) by counting the movements of the flank;

(ii) by observing the movements of the nostrils.

(iii) by feeling the gushes of exhaled warm air on the back side of the palm placed near the nostrils.

It should be noted that one rise and one fall of the flank with an interval constitute one respiration.

Order of recording:

When taking temperature, pulse and respiration, it is necessary to proceed as follows:

Stand quitely near the animal, which has been given enough time to settle down in its new surroundings. Count the respiration first while still standing away from the animal, before the animal is handled. Then count the pulse and finally, take the temperature which

Normal Values:

	Body temperature	*Pulse rate*	*Respiration rate*
Cattle	38.6°C	50-60 minute	20-26 minute
Buffaloes	36.8-39.4°C	40-50 minute	15-20 minute

The values are generally lower in older animals.

is always the slowest to respond to excitement or fear. This may require some restraint. Both pulse and respiration rates are liable to acceleration to a varing degree due to fear, anger or pain. Mere handling an excitable and nervous animal will also have the same effect.

22.3 Precautions

— Do not disturb or excite the animal unduly while recording.
— Do not touch the bulb of the thermometer.
— Take care to see that the bulb of the thermometer touches the rectal wall while recording temperature
— Never count both rises and falls f the flank for respiration rate.

22.4 Materials required

1. clinical thermometer
2. Vaseline
3. Cotton wool
4. Stop-watch or wrist watch
5. Stethoscope
6. Animal

22.5 Procedure

1. Recording the respiration rate:

Stand at a distance from the animal, on one side.
— Observe the rise and fall of the flank on any side of the animal.
— Count the number of either falls or rises of the flank region in one minute using a stop or wrist watch.

2. Recording of pulse rate:

— Secure the animal and stand well behind.
— Extend the tail and grasp the tail from above with the left hand.
— Pass the four small fingers under the tail about 6-8 cm from the tail head.
— Locate the coccygeal artery and feel pulsations with it by placing the bulb of the middle finger on it.
— Record the pulse rate as variation in succeeding expansions and contractions of the artery for one minute with a stop or wrist watch.
— Use a stethoscope for auscultation directly over the heart (a point on the chest wall just inside the left elbow point) if the pulse is weak.

3. Recording of body temperature:

— Secure the animal and stand well behind.
— Reduce the clinical thermometer reading to the minimum level by giving it one or two jerks.
— Lubricate the thermometer bulb with vaseline.
— Insert the thermometer into the rectum so that the bulb comes in contact with the mucus membrane guarding the bulb with

the finger.

— Keep thermometer in this position for one minute.

— Take the thermometer out of rectum after a minute, clean it with a cotton wool and then read the temperature from the mercury column.

22.6 Observations

The pupil should record the pulse, respiration rates and temperature of at least three animals in the following proforma.

Sl. No.	*Name of animal/or name of the owner*	*Species sex*	*Body temp. 0°C*	*Pulse rate/ minute*	*Respiration rate/minute*
1.					
2.					
3.					
	Average				

22.7 Expected behavioural outcomes

The pupil will be able to:

— realize the importance of recording pulse, temperature and respiration;
— record pulse, temperature and respiration correctly;
— record variations in pulse, respiration and temperature among animals.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Answer the following questions in one or two sentences

(i) What is the importance of recording pulse, temperature and respiration?

(ii) What are the factors that cause variation in the respiration, pulse rate and temperature in cattle?

(iii) What precautions will you take while recording respiration.

2. Tick (✓) the correct answer.

(i) The level of the mercury column of the thermometer should be brought to the minimum by jerking (before/after) recording.

(ii) For recording respirations one must count both rises and falls/either rises or falls of flank.

(iii) Pulse rate can be known by feeling the pulsations in superficial arteries/veins.

ACTIVITY UNIT 23

Testing Milk for Mastitis

23.1 Instructional objectives

The pupil should be able to:

- recall the importance of mastitis control;
- prepare different reagents used in mastitis tests;
- conduct the mastitis detection tests;
- differentiate between normal milk and milk from the udder affected with mastitis according to graduation in the test results.

23.2 Relevant information

What is mastitis:

Mastitis, commonly known as inflammation of the udder, is one of the most serious diseases of dairy cattle and buffaloes. The disease is caused by several types of germs that find entry into the udder. The main reasons due to which mastitis occurs are: (i) Unhygienic conditions of animals sheds (ii) lack of care during milking (iii) Injury to the udder. Many farmers milk the cows by lubricating the udder with froth from the milking pail, saliva on wash water from the ground, and also do not wash the udder after milking. this practice attracts flies that carry disease causing germs. Oftęn, the udder gets injured due to biting by the calf, barbed wire of fencing, crushing of the udder by the feet of fellow animals and other accidents. All these conditions inflict injury to the udder tissue that leads to mastitis. Sometimes, the injury to the udder is not visible and the milk also appears to be normal In such situations, the animals loses weight and a serious drop in milk production is noticed.

Why detect mastitis?

Whatever may be the cause of mastitis, the net result is swelling of the udder, reduction in milk yield and alteration in quality of milk. The affected milk turns whey-like or even tined with blood. In such conditions the mastitis is easily detected. When there is an unobservable injury or infection of the udder, it becomes necessary to test the milk from such animals for the presence of the disease. Such early detection helps in preventing the disease becoming more serious. There are a few tests recommended for routine detection of mastitis. Early detection of mastitis prevents serious losses and helps in prompt treatment. The common mastitis test are — (i) Bromothymol Blue Test (B.T.B.T.), (ii) White Side test, (iii) Sodium Lauryl Sulphate Test (S.L.S.T.)

(i) Bromothymol Blue Test: A definite quantity of milk and B.T.B. solution is mixed. The change in colour of the indicator (BTB) from red-yellow to bluish-green indicates that th test for mastitis is positive. No change in colour indicates normal milk.

(ii) White Side Test: Milk drawn from mastitis affected udders has a high level of white blood cells. Equal quantities of milk and a solution of sodium hydroxide (caustic soda) are added. In mastitis milk, the mixture gets precipitated.

(iii) Sodium Lauryl Sulphate Test: Equal quantities of freshly drawn milk and

SLST solution is mixed in a paddle. Mastitis milk becomes viscid on rotation.

23.3 Precautions

— Milk should be collected only from one quarter (teat) of the udder at a time.
— The paddle to be used should be thoroughly washed before use.
— Reagents to be used should be prepared correctly or purchased from a reliable firm.
— See that the paddle is vigourously shaken in a horizontal plane for at least 20 seconds.
— Repeat the test if there is any confusion in interpretation.

23.4 Materials required

1. Reagents

(i) Bromothymol Blue (0.2 percent alcoholic solution)
(ii) Sodium hydroxide solution (1 N solution)
(iii) Sodium Lauryl Sulphate solution 4 gm (i.e. 15 ml. of Teepol and 85 ml. of distilled water mixed and stocked in a reagent bottle).

2. Apparatus

(i) Reagent bottles with reagents
(ii) Paddle
(iii) Bucket
(iv) Khadi cloth
(v) Water
(vi) Cotton rope for securing animal
(vii) Glass test-tube
(viii) Glass plate with black background.

23.5 Procedure

1. Bormotymol Blue Test:

— Secure the animal with a rope.
— Wash the udder with clean lukewarm water.
— Mop and dry the udder with a clean, dry, *khadi* cloth.
— Collect 5 ml of milk in a test-tube.
— Add 5 drops of BTB solution.
— Shake the mixture well.
— Note the change in colour.
— Draw the inference from the results as shown in observations.

2. White Side Test:

— Secure the animal with a rope.
— Wash the udder with clean lukewarm water.
— Mop and dry the udder with a clean, dry, khadi cloth.

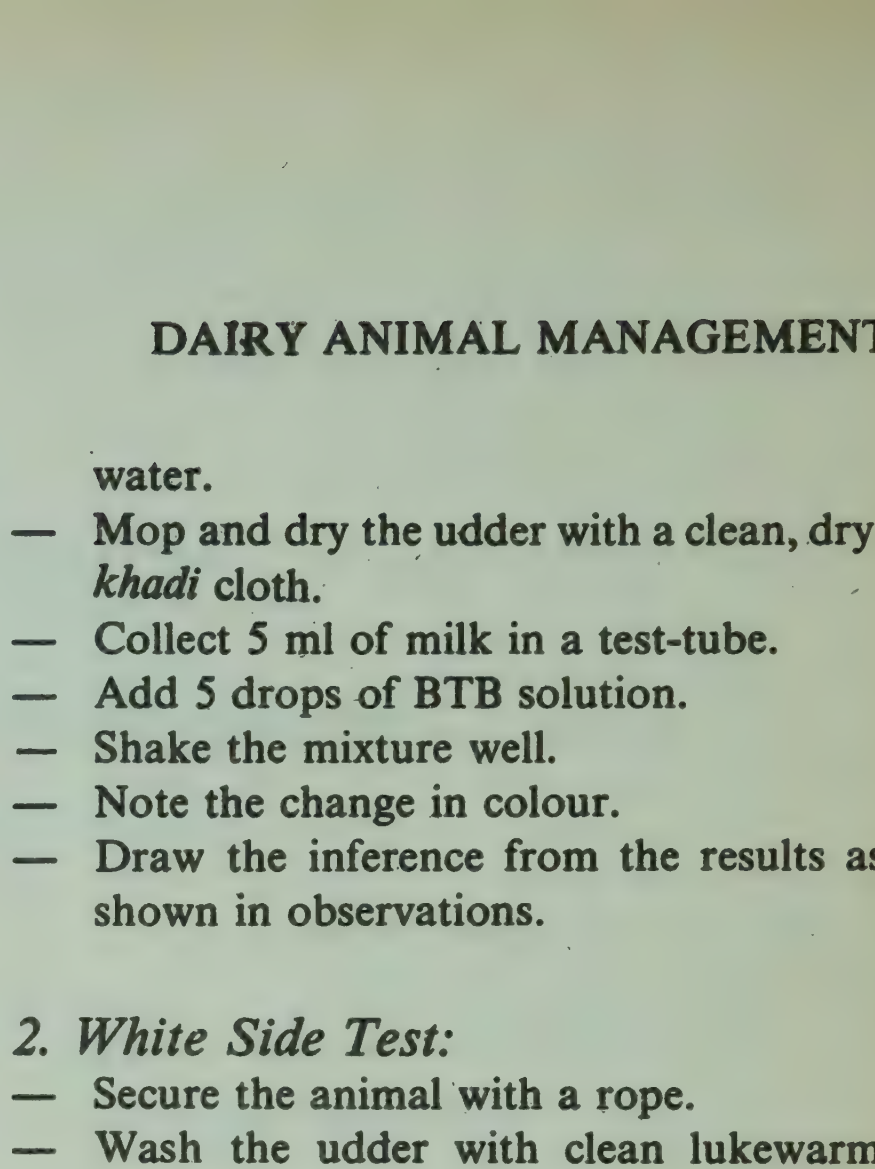

FIG. 23.5.1 PLASTIC PADDLE WITH FOUR SEPARAT PEGS FOR THE FOUR QUARTERS OF TH UDDER—USED IN CALIFORNIA MASTIT TEST.

— Put 5 drops of milk on a glass plate directly from the teats.
— Add one drop of sodium hydroxide solution.
— Stirr the milk-alkali (sodium hydroxide) mixture with a glass rod for 20 seconds.
— Observe for the formation of absence of white precipitate or viscid mass.
— Grade and draw interpretation.

3. Sodium Lauryl Sulphate Test:

— Secure the animal with a rope.
— Wash the udder with clean luke warm water.
— Mop and dry the udder with clean, dry, khadi cloth.
— Hold the paddle with the handle in your left hand.
— Draw 5 ml milk from the four teats into the four cups of paddle Fig. 23.5.1.
— Add equal volume of SLST solution in each cup of the paddle.
— Shake the paddle vigourously in a horizontal plane for 20 seconds.
— Observe the reaction, grade and draw interpretation.

23.6 Observations

The pupil should record and express results in the following manner:

1. Bromothymol Blue Test:

Positive (+) development of green o bluish green colour indicates mastitis.

Negative (-) no change in colour indicates normal milk.

2. White Side Test:

If there is a precipitate after stirring the milk-alkali mixture, then the milk under testing is from a mastitis udder. The degree of infection will be known from the following.

	Recording	*Grade*	*Test sample*
(i)	Thick gelatinous mass which does not break	IV (several)	
(ii)	Viscid mass composed of larger particles floating in an opaque liquid	III (moderate)	
(iii)	Particles in groups	II (mild)	
(iv)	Small particles	I (sub-clinical)	
(v)	No change in milk	Normal	

Grade	*Reaction*	*Inference*
o	When paddle is tilted there is no slow flowing viscid mass under free flowing milk.	Normal milk
+	Thin layer of slow flowing viscid mass when milk flows to one side.	Mild mastitis

++	Viscid material clearly visible.	Mild to severe mastitis
+++	Central zone of viscid mass in paddle on rotation	Severe mastitis clearly exhibiting symptoms.

23.7 Expected behavioural outcomes

The pupil will be able to:

— collect milk samples from udder for tests;
— carryout the mastitis tests by any of the available methods reagents;
— grade the degree of mastitis;

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Answer the following questions in one or two sentences

(i) What is mastitis?
(ii) What are the causes of mastitis?
(iii) Why should we detect mastitis in dairy animals?

2. Fill in the blanks

(i) We can detect mastitis by _____ (appearance of udder/tests on milk).
(ii) A paddle consists of _____ cups with handle (2/4)
(iii) The udder should be _____ before collection of milk samples (washed/wiped).
(iv) The paddle should be _____ thoroughly before testing the next cow (washed/dried).
(v) Mastitis milk mixed with BTB reagent turns _____ in colour (green/yellow).

ACTIVITY UNIT 24

First Aid on the Dairy Farm

24.1 Instructional objectives

The pupil should be able to:

- recall the various ways of first aid to dairy animals;
- be familiar with a first aid kit.
- carry out first aid with utmost cleanliness and confidence;
- treat simple injuries;
- handle the animals and administer medicines.

24.2 Relevant information

Aim of first aid to dairy animals:

The aim of first aid is to render skilled assistance to the affected animals that will alleviate suffering, preserve life, promote recovery or prevent aggravation of the abnormal condition until the arrival of the veternary doctor. It is also aimed at ensuring the greatest possible peace and comfort to the animal during transportation to a veterinary hospital.

Techniques of first aid:

The sick or affected animal is given first aid in many ways. This will depend on the nature of the disease or the nature of the injury the animal is suffering from. For this purpose the person attending the animal, needs to know the history of the sickness or injury. This helps to render first aid to the animal and at the same time assists him in reporting to the veterinary doctor.

First aid can be given by:

(i) removing the cause of the disease or injury;
(ii) arresting the bleeding;
(iii) providing plenty of fresh air to the patient;
(iv) providing warmth to check fall in body temperature and shock;
(v) providing rest by changing the position of the animal to an easy posture;
(vi) covering with a clean dressing over all skin injuries;
(vii) keeping the animal calm and quiet by diverting its attention towards some feed.

The importance of providing early first aid need not be over emphasized. Nonetheless, the person attending to the sick animal has to decide whether the animal needs a veterinary doctor's assistance. If so, he has to ascertain whether to take the animal to the veterinary hospital or to invite the veterinary doctor to the farm to render treatment.

Types of ailment for which first aid is given:

The result of a physical injury due to a fall or a fight between animals can be as simple as a minor skin cut or as complex as a multiple fracture. The first thing to be done in such conditions is to stop the bleeding.

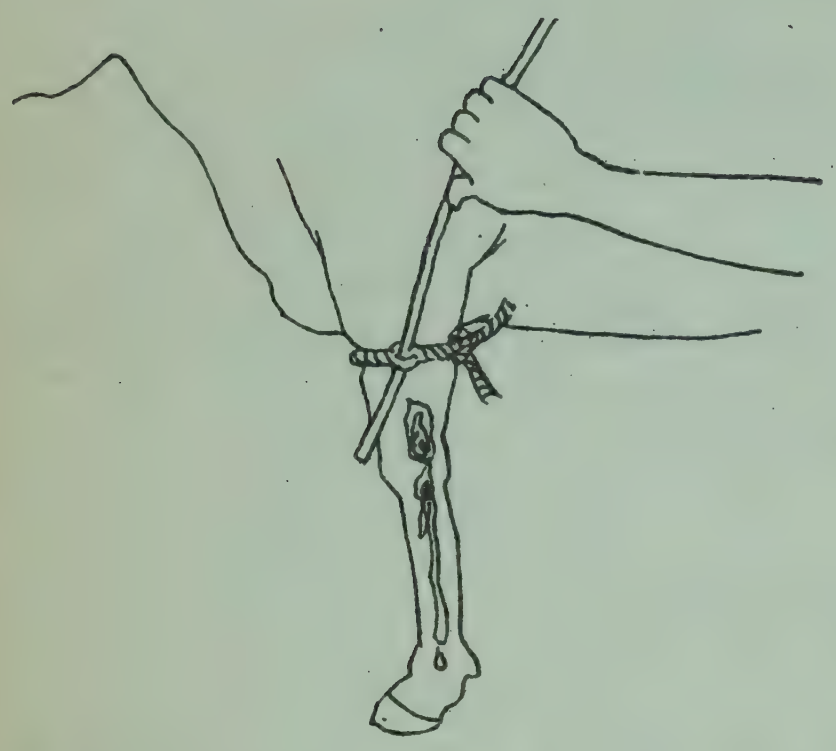

FIG. 24.2.1 METHOD OF APPLYING A TORNIQUET ON AN INJURED LIMB TO STOP BLEEDING

1. Bleeding injuries:

The bleeding can be simple or heavy. The bleeding in simple cases is arrested by keeping a pad over the injury by means of a bandage for about five minutes. Bleeding from limbs is stopped by using a tourniquet. For this purpose, a piece of rubber tubing, 1 cm in diameter; a folded handkerchief or a cotton tape is used. The tubing is looped around the limb and the two ends tied together into knot. A stick is inserted into the loop which is then tightened by twisting the stick (Fig. 24.2.1).

Bruise: A bruise results from the rupture of tiny blood vessels following a blow or fall and is very painful. This type of injury is treated by bathing the affected part with cold water 2-3 times a day.

Open wound: In case there is not much bleeding, the open wound is washed with clean cold water or weak (faint pink) potassium permanganate lotion. The wound is dried and covered with gauze and bandaged. Dusting of sulphanilamide powder over the wound is done before covering it.

Udder/teat injury: Even the smallest injury over the udder/teat needs careful attention and prompt treatment. Carelessness leads to mastitis. A dry dressing of sulphanilamide or antiseptic cream is effective and is applied over the injury.

Feet and horn injuries: Feet injuries one treated like any other injury after paring away all dung and dirt. In case of horn injuries, since it is difficult to stop bleeding application of a tourniquet at the base of the horn is recommended. At the same time application of tincture benzoin Co solution and bandage over the injured portion can help in treating the injury.

Eye injuries: Eye injuries are mainly due to the presence of grit, chaff, a thron or seed. The eye is washed with clean water and a two of castor oil is put in the injured eye.

Fractures: A fracture is generally not treated by an in experienced person. The services of the veterinary doctor have to be sought for treating fractures. Meanwhile, the fractured wound is kept clean and the animal is made comfortable by offering it good feed and fodder.

2. Poisoning on animal farms:

The common use of poisonous agricultural chemicals, fertilizers and the presence of toxic plants on a farm, necessitates the knowledge of first aid to such cases.

Common sources of poisons on farms are fodder sprayed with pesticides, lead paints, insecticides used in tick and mite control. In such cases, the affected animal is kept in a safe place. To prevent further absorption of

poison by the skin the animal is washed with soap and water. Any skin application available in the market is used after washing. Plenty of water is given to drink to dilute the poison which has consumed. A list of poisonous substances and their physiological and/or chemical antidotes used for neutralizing the poison is given below:

Poison	*Antidote*
Acids	— Alkalis such as bicarbonate of soda
Alkalis	— Vinergar, lemon juice, tartaric acid.
Bleaching powder	— White of egg.
Carbolic acid (phenol)—	White of egg, sodium sulphate
Copper sulphate	— White of egg.
Urea	— 10 percent acetic acid.
Organophosphates. (Malathion etc.)	— Atropine sulphate 1 mg/kg body weight given as injections.

3. First aid for burns:

Burns in dairy animal are very painful and difficult to control. Burns caused by acids are treated with an alkali solution (washing soda 10g in a litre of water) and burns caused by alkalis like caustic soda are treated with equal parts of Vinegar and warm water.

4. Difficult calving:

It is good to watch the cow giving birth from a distance. Help may be given to the animal only when there is difficul y and the animal is not able to deliver the calf within normal time. This is accomplished by applying gentle traction to the fetus to aid delivery. It is better to seek prompt veterinary aid from a veterinary doctor.

5. Bloat:

Bloat is accumulation of gas in the rumen (1st stomach) of the cow and buffalo. Due to faulty feeding and excess of leguminous feed, excessive gas formation takes place. Bloat is treated by giving a mixture of oil of turpentine and common edible oil. In severe cases a trocar and canula is used on the left flank region which quickly releases gas.

24.3. Precautions

— Keep the animal quiet by all the means at your command.
— Handle medicines with clean hands.
— Do not treat serious cases that require the assistance of a veterinary doctor.
— Do not introduce fingers or equipment into the genital tract.
— Replenish the medicine in the first aid kit immediately after it is used.
— Avoid access of children and animals to the first aid kit.

24.4 Materials required

1.A. Animal

2. First aid kit: On all farms, a box containing the items mentioned below should be kept handy so that it can be reached quickly in case of emergencies.

(i) Cotton wool,
(ii) Bandages
(iii) Surgical gauze

(iv) Old cotton sheets
(v) Rubber tubing
(vi) Surgical scissors — curved and made of stainless steel.
(vii) Forceps, splints or split bamboos (for fractures)
(viii) Clinical thermometer — two or three.
(ix) Disinfectants-potassium permanganate. Acriflavine — Dettol — Sulphanilamide powder
(x) Tannic acid — powder (for poisons) and jelly (for burns)
(xi) Caster oil (for eye drops)
(xii) Edible oil (for bloat)
(xiii) Epsom salts
(xiv) Copper sulphate
(xv) Clauber's salt
(xvi) Oil of turpentine (for bloat)
(xvii) Tincture of iodine.
(xviii) Tincture Benzoin Co. (for wounds)
(xix) Cotton ropes
(xx) Halters (for restraining)
(xxi) Trocar and Canula (for bloat)
(xxii) Pocket knife (for cutting, ropes, etc.)

24.5. Procedure

— Obtain the detailed history of the animal that needs first aid.
— Observe the animal from a distance.
— Decide the treatment as per the history and symptoms.
— Make sure that the animal is secured.
— Clean the injuries with water containing mild antiseptic lotion.
— Apply a tourniquet, if necessary, to stop bleeding.
— Apply dry dressing with sulphanilamide powder to wounds.
— Apply gauze and bandage.
— Check the milk in case of udder injury.
— Drench the appropriate antidote solution in case of poisoning.
— for handling difficult calving, ascertain the position of the fetus first, apply lubricant to the vagina to help calving tiea rope to the legs of calf and give a gentle traction. If abnormal position of the fetus is noted send for a veterinary doctor.
— For simple bloat, give a mixture of turpentine oil and common oil. In serious cases puncture the rumen with trocar and canula. After puncturing remove trocar and leave canula in position. Administer turpentine oil and common oil mixture in the rumen through canula. Remove canula after 5-10 minutes.
— Treat the punctured wound as a normal fresh injury.
— Keep the animal calm and quiet.
— Repeat treatment wherever necessary.

24.6 Expected behavioural outcomes

The pupil will be able to:
— recall the importance of first and kit,
— render first aid with confidence;
— judge the animal that requires first aid assistance;
— avert the incidence of poisoning;
— help his neighbour in first aid.
— The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick mark (✓) the correct answers

(i) One of the ways of giving first aid to animals is by:
- (a) exciting the animal
- (b) keeping the animal calm and quiet
- (c) tying up the animal

(ii) Applying a tourniquet is to:
- (a) stop bleeding
- (b) applying medicine
- (c) applying rope

(iii) Negligence in udder injuries leads to:
- (a) difficulty in calving
- (b) mastitis
- (c) bloat

(iv) In severe bloat the trocar and canula is used to puncture:
- (a) rumen through left side of flank.
- (b) rumen through right side of flank.

(v) In handling difficult calving, the operator should give a:
- (a) gentle traction
- (b) apply force and pull
- (c) push in and wait

ACTIVITY UNIT 25

Administration of Medicines

25.1 Instructional objectives

The pupil should be able to:

— recall the techniques of administration of medicines;

— administer medicines by various methods independently.

25.2. Relevant information

Medicines are administered for treating a disease or illness. There are many ways of giving medicines to animals. Oral administration of medicines very often has to be practised for simple ailments like deworming, bloat, etc.

Oral administration of medicines in dairy cattle is done as drenching, electuary, boluses (balls) and pills.

Drenches are medicines given in liquid form. They should not be employed in the case of respiratory complaints because of the risk of choking. Wrong drenching can cause choking and death.

Electuaries are thick viscid mixtures prepared with jaggery and placed on the molar teeth or on the surface of the tongue, and rubbed on the palate. Powders are often given by this method. It is a common way of giving medicines for respiratory complaints or when swallowing is difficult.

Boluses or balls or pills can be used for administering certain medicines to cattle. If given by hand, a gag must be used. A balling gun may be necessary for young cattle. Boluses are large and are generally given to adult animals while pills are used for calves.

25.3 Precautions

— Stop drenching forthwith if the animal coughs and lowers its head.

— Do not drench in case of respiratory affections.

— See that your hands are clean before administering medicines.

— Ensure that the instruments used for drenching are cleaned before and after use to prevent spread of infection.

25.4 Materials required

1. Drencher (wooden or metal)
2. Enamel drenching cup with a spout
3. Balling-gun
4. Mouth gag
5. Halter
6. Rope
7. Medicines
8. Electurary

25.5 Procedure

1. Drenching:

— Secure the animal with halter and rope and stand on the right side of the animal.

— Raise the head until the head and back are in a straight line.

— Open the mouth from the side of the head at the angle of the mouth by the left hand.

— Administer the medicine slowly, by means of a drencher. Use a wooden or

metal drenching bottle for adults and an enamel drenching cup for calves from the other side of the head with the right hand.

2. Boluses or pills:

— Use a balling gun (Fig. 25.5) for administering boluses or pills for calves or young cattle.
— Use a mouth gag for administering boluses or pills by hand for cattle.
— Use the hand only when no balling gun is available.
— See that the bolus is placed directly at the entrance of the throat so that the animal is forced to swallow it.

3. Electuary:

— Secure the animal and raise its head.
— Place the electuary well back on the surface of the tongue or between the molar teeth or rub it on the palate.
— Lower the head as the animal moves its tongue and jaws vigorously and swallows the medicine.

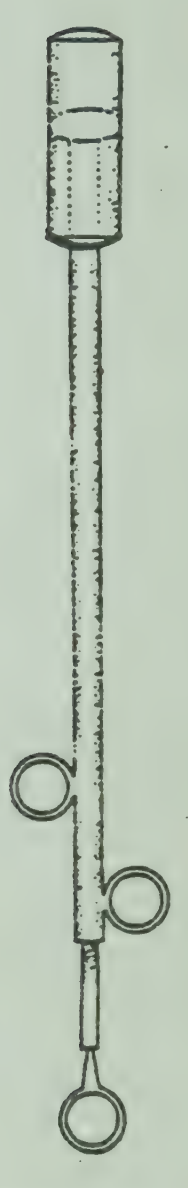

FIG. 25.5 METAL BALLING-GUN

25.6 Expected behavioural outcomes

The pupil will be able to:

— administer the medicines correctively;
— select the appropriate method for a particular condition;

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Use the correct word as an answer

(i) A drench is a medicine in liquid/solid form.
(ii) An electuary is placed in the mouth by hand/balling gun.
(iii) Drenching is not done in respiratory/digestive complaints.
(iv) Bolus/electuary should be used orally in case of respiratory infections.
(v) While drenching of an animal the drenching has to be stopped/slowed if the anima coughs.
(vi) The drencher or feeding cup should be cleaned before and after use to prevent s ·ea of infection/medicine.

ACTIVITY UNIT 26

Disposal of Carcasses

26.1 Instructional objectives

The pupil should be able to:

— recall the importance of proper disposal of carcasses;
— get acquainted with the methods of carcass disposal;
— carry out proper disposal of carcasses.

26.2 Relevant information

Proper disposal of caarcasses is important to prevent the spread of contagious diseases and to prevent human infection as in the case of anthrax. The carcasses should never be disposed of by depositing them in or near a stream of flowing water as this will carry infection to points downstream. An animal that dies of contagious disease should not be allowed to remain for any length of time in sheds as biting insects, rodents, etc., can reach it. Unless approved by a veterinarian, it is not safe to open the carcasses of animals or remove the skin of animals that have died of disease.

All carcasses should be disposed of properly, either by burying or by burning.

Burial of carcasses:

The most common method of carcass disposal is burial. It should be done deep enough in soil from which there is no drainage to neighbouring places. Never drag the carcass to the burial place; carry it in a trolley. The depth of the burial pit should be at least 2 m and the size depending upon the size depending upon the size of the animal. Kerosene or crude phenol should be spinkled impalatable to animals.

Burning of carcasses:

The most sanitary method of destroying a carcass is to burn it, preferably close to site of death. Do not drag the carcass but carry it in a trolley. Burning, however, involves the cost of fuel.

In towns or cities, carcass utilization plants are available for industrial utilization of animal carcasses for their fat content and bones. On informing these plants, the carcasses are collected by them.

26.3 Precautions

— Avoid disposal of carcasses in or near flowing water.
— Avoid dragging of carcasses. Carry them in a trolley.
— See that the depth of the burial pit is 1.5 m above the highest part of the carcass.
— Avoid opening of carcass or deskinning of animals that have died of disease.

26.4 Materials required

1. Crow-bar
2. Iron baskets
3. Spade
4. Trolley
5. Lime
6. Firewood

26.5 Procedure

1. Burial of carcasses:

— Dig a pit of suitable dimension depending

upon the size of the animal.
- Sprinkle kerosene or phenol over the carcass.
- Put a layer of lime at the bottom of the pit.
- Transfer the carcass to the pit and spread the lime over it completely.
- Cover the whole pit with mud or soil.
- Cover it up with thorny bush.
- Clean and disinfect the area where the animal was kept before it died.
- Dispose of the unused fodder of the animal properly.
- Clean and disinfect the utensils and chains used for the dead animal.

2. Burning of carcasses:
- Dig a trench of at least 0.5 m depth in the direction of the prevailing wind.
- Fill the trench with wood and place the carcass there on.
- Set fire to the wood; the carcass will be completely burnt and, with it, all infectious material.
- Clean and disinfect the area where the animal was kept before it died.
- Dispose of the unused fodder of the animal properly.
- Clean and disinfect the utensils and chains used for the dead animal.

26.6 Expected behavioural outcomes

The pupil will be able to:
- recall the importance of proper disposal of carcasses;
- take proper precautions for proper disposal;
- dispose of the carcass properly.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Answer the following in one or two sentences.

(i) What is the importance of proper disposal of carcasses?
(ii) What are the methods of disposal of carcaasses?
(iii) What are the precautions to be taken before the disposal of a carcass?
(iv) Why is a layer of lime put in the pit before burying a carcass in it?
(v) Why is phenol or kerosene sprinkled over a carcass before its burial?

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ACTIVITY UNIT 27

Study of Daily Farm Routine

27.1 Instructional objectives

The pupil should be able to:

— recall the importance of daily farm routines;

— get acquainted with plan and execute daily farm routine operations; the daily farm routine systematically and effectively.

27.2 Relevant information

The daily farm routine includes planning, organization and execution of various activities on a dairy farm. The planning may be of a long range or of a short range Organization includes mobilization o required resources and execution of the actua job/activity. Some activities are such that they do not allow any alternative. Fo example, milking of a cow has to be done treatment of a minor/major ailment has to be carried out, delivery of milk must be taken up immediately. The daily routine of various activities can be written down in a logical sequence for efficiency through careful planning. The daily farm routine operations are as follows:

Approximate Time (Hours)	*Farm operations*
0.3.00-3.30	(i) Cleaning of milch animals.
03.00-05.00	(i) Milking of cows. (ii) Feeding half of the concentrate ration just before milking.
05.00-05.30	(i) Delivery of the raw milk to the pick-up milk vans of the dairy plant and receiving the previous days empty cans or sending milk to the market by bicycle, *ricksha, tonga* or truck.
05.30-07.00	(i) Washing and disinfecting of milking parlour. (ii) Feeding dry (if available green) fodder to milch cows. (iii) Cleaning of milch cow shed. (iv) Cleaning of farm premises. (v) Isolation of sick animals. (vi) Isolation of 'in-heat' cows, parading teaser bull. Note: (a) Engage milkers for all the jobs up to 07.00 hrs, when they go off duty and return by 14.30 hrs. (b) The dairy manager should personally examine animals for health and look out for 'in-heat' cows.

(c) Labour meant for other farm operations resume duty by 08.00 hrs, and will stay up to 17.00

08.00-10.00	(i)	Cleaning of calf sheds, bull sheds, maternity pens, dry cow sheds, etc.
	(ii)	Feeding half of the daily concentrates to the calves, pregnant cows and bulls. Feeding milk to the young calves should also be done during this period.
	(iii)	Exercising and grooming of bulls.
	(iv)	Taking sick animals to the veterinary hospital.
	(v)	Taking 'in-heat' cows to artificial insemination centre (if artificial insemination is practised) for breeding or arranging natural breeding.
	(vi)	Harvesting and taking green fodder to farm premises. Some labourers should be sent to the fields by 08.00 hrs for this purpose.
10.00-12.00	(i)	Chaffing and feeding of green fodders to all the animals. Managers in all the sheds should be filled with green fodder repeatedly, as the animals eat from them.
12.00-13.00	(i)	Lunch-cum-rest period for labourers.
13.00-15.00	(i)	Miscellaneous jobs of the dairy farm — stock identification, periodical vaccination, preparation of concentrate mixture, repair of farm fence fitting and equipment; rope and halter making, weekly scrubbing and white-washing of drinking water tanks, manure disposal/conservation, periodical spraying of pesticides on animals and animal sheds, periodical deworming of the stock, clipping of excess hairs from sides and hind quarters of cows, grooming, toe trimming, dehorning of calves, attending to sale and purchase of livestock and their transportation, providing the farm store etc. The dairy manager should plan the jobs well in advance in such a way that they are distributed over a week. Some jobs require a longer time and on such days, the labourers will have to work extra time.
14.30-15.00	(i)	Milkers resume their second shift duties and wash milch cows.
15.00-15.30	(i)	Milking to be done by milkers.
	(ii)	Milkers to feed the second half of the daily concentrateration just before milking.
	(iii)	Farm labourers to clean calf, maternity, bull and dry cow sheds and feed the second half of the daily ration (concentrate) to the calves, pregnant cows and bulls.

16.30-17.00	(i)	Delivery of milk by milkers to the pick-up van of the milk plant and collection of the mornings empty cans or sending milk to market.
	(ii)	Washing and disinfection of milking parlour (by milkers).
	(iii)	Chaffing and feeding of greens, or dry roughages to calves, cows, bulls, and bullocks (by farm labourers).
17.00-17.30	(i)	Washing of milch cow barn (by milkers)
17.30-18.30	(i)	Feeding green and dry fodder to milch cows.(by milkers)
	(ii)	Cleaning farm premises by milkers. Milkers go off duty.
18.30 onwards	(i)	Night watchmen come on duty.
	(ii)	The dairy manager should take a closing-hour round and ensure that the night watchmen and guards have takup their positions.

27.3 Precautions

— Do not forget to inform about your visit to the dairy farm manager.
— Do not forget to inform about the date, time and purpose of visit to the dairy farm manager.
— Seek instructions from the farm manager about the date and time of your arrival at the farm.

27.4 Materials required

1. Notebook
2. Pencil/pen
3. Lunch Box
4. Measuring tape, etc.

27.5 Procedure

— Arrive at the farm well in time and on the date suggested by the farm manager.
— Contact the farm manager and note down the programme which he has chalked out for you.
— Follow the programme and if the farm manager is accompaning you, follow time and observe and note down necessary information which going through the routine operations at the farm.
— Seek clarifications and have discussions if necessary, with regard to the routine operations.
— Visit the farm as many times as required for the study of routine operations.
— Collect relevant data which may help you to give a broad picture of the farm.

27.6 Observations

The pupil should collect and record the following information at least for one day in the following.

TABLE A
Daily schedule

Timing	*Job to be attended*	*Actual time of completing job*
03.00-03.00	(Name of the job to be attended)	

TABLE B
Labour

Sr. No.	*Name of the job*	*Estimated of labour required*	*Actual material labour used*

TABLE C
Materials

Sr. No.	*Name of the job/ operation*	*Targeted qty. to be used*	*Actual materials used*
i.	Concentrate feeding.		_____Kg.
ii.	Green feeding		_____Kg.
iii.	Dry roughage feeding		_____Kg.
iv.	Medicines		_____Kg.
v.	Fertilizers applied		_____Kg.

QUESTIONS

1. Tick mark (✔) the correcct answers .

(i) Preparation of routine plans of farms includes planning/organization/execution/ supervision.

(ii) Both skilled and unskilled labourers are essential/not essential for the daily routine of a dairy farm.

(iii) The characteristics of dairy operations allow/do not allow compromise with time.

(iv) The farm manager needs to take stock of things daily/weekly/fortnightly and alter plans of the operation accordingly.

(v) Variation in out put of the units occur due to faulty planning/variation in inputs/unforseen factors.

(vi) The daily routine includes the operations of insemination/attending to parturient cows vaccination.

2. Fill in the blanks

(i) The daily labour sheet is the summary of _____ of the labour hours for specific jobs.

(ii) Milk utensils are washed with _____ water and are dried in _____.

(iii) Concentrate feeding is done _____ daily.

(iv) Roughages are fed _____ daily.

(v) Milk is delivered _____ a day.

(vi) Dairy cows are grommed every _____.

ACTIVITY UNIT 28

Preparation of Animals for Show

28.1 Instructional Objectives

The pupil should be able to:

— recall the importance of showing animals at local or state fairs;
— prepare animals properly for the show;
— realize the showing of animals as a method of advertising his herd's superiority.

28.2 Relevant information

The breeder of dairy cattle should consider not only the production of his cows but also their type. Production and type go hand in hand in the best breeding establishments. One of the most effective means of establishing and advertising a herd is by the public exhibition of dairy animals. The dairy shows in the country, - the national, state and district fairs- are excellent educational institutions. The selection and preparation of animals for shows and rallies offer individual breeders opportunities to exhibit their best animals to the public and arouse interest and competitiveness in breeding animals of that type. Information about and acquaintance with any particular breed, can be obtained by watching the placements made at some of the good dairy shows.

Transportation of the prepared animals has to be carried out properly so that the animals do not get injured, diseased and dirty or lose weight and good appearance. Hence, the need to study the methods of transporting animals.

29.3 Precautions

— See that all the animals to be exhibited are typical of the breed, and type.
— Transport the animals by truck when the place of the show is within 200 to 300 kilometres.
— Take care to see that these animals reach the destination in a fit condition.
— The arrange loading of animals in such a way that the animals reach the place just one day prior to the day of commmencement of the show.

28.4 Materials required

1. For preparation

(i) Best animals of the herd
(ii) Leading rope
(iii) Leather or rope halter
(iv) Body brush and curry comb
(v) Soft soap
(vi) Hair clipper
(vii) Buckets
(viii) Coconut oil
(ix) Sandpaper
(x) Blanket or jhool
(xi) Hoof and horn rasp
(xii) Dusters
(xiii) Soapex
(xiv) pair of scissors
(xv) Hot water

2. For transporting by rail and road

(i) C.A. type wagon
(ii) Lime
(iii) Bamboo or casuarina poles of 7.5 cm

diameter
(iv) Tub for storing water
(v) Buckets
(vi) Brooms
(vii) Milking pails
(viii) Bedding material
(ix) Fodder and concentrate for journey
(x) Lantern
(xi) Torch
(xii) Tincture of iodine and cotton
(xiii) Sweet oil and drencher
(xiv) Phenol
(xv) Carminatives or stomachich powders.
(xvi) Truck with high sides
(xvii) 5 or 6 bamboo sticks of 5 cm diameter and 3 MM length
(xviii) Ropes.

28.5 Procedure

1. Selection and preparation of animals:

Four to six weeks before the show select an animal that is representative of its breed with typical breed characters possessing good dairy conformation and temperament, proper growth and development for its age, proper condition of fleshing, freedom from defects or defarmity.

— Feed 1 kg extra concentrate a day to all show animals depending upon the condition of the animal.
— Give 0.250 g of groundnut cake to the show animal, to improve the condition of its coat.
— Feed roughages of choice.
— Wash the animal daily with soft soap and dry it with a duster to improve the condition of the coat.
— Groom the animal thoroughly after washing and drying and look for ticks and lice which may be brushed off.
— Put a gunny bag or *jhool* over the animal for some time during the day and throughout the night to avoid any soiling.
— Provide sufficient amount of bedding for the animal in the stall.
— Trim overgrown hooves and give them proper shape to improve the appearance and gait using a shoe trimming knife.
— Rasp the horns to make them look symmetrical.
— Clip hair from belly and udder of cows to show quality and to enhance the appearance of milk and udder veins. Head and tail should also be clipped.
— Train the animal to get accustomed to handling and being led by a helper. Train the animal to lead, back, stand, pose or change position on verbal command.
— The animal should be led, holding the rope nearest to the head which in turn will teach the animal to keep the head erect while walking and standing.
— Train yourself to display the animal in the show ring to its best advantage.
— Check occasionally to see that your animal is eating, ruminating and resting normally.
— On the day of the show pay special attention to washing of the animal.
— Put a tablespoon of soape in ½ a bucket of hot water and mix it thoroughly and rub over the animals body with a duster.
— Alow it to dry for half an hour and brush the animal's body with a duster. This gives a lustre to the coat.
— Apply a little coconut oil to the horns and hooves after scraping with sandpaper to give a good polish.
— Apply a little coconut oil to the switch of the tail to give it a fluffy appearance.
— Milk the animal several hours before the commencement of judging so that at the time of judging the udder is full.
— Polish halters and the leading rope before

they are put on the animal.
— Take care that the animal is in proper fill before entering the show ring. This is achieved by keeping the animals thirsty for some time and watering it just before enterting the show ring.
— At the call over the loudspeaker, lead the animal into the ring with an attractive, properly fitting halter.
— Lead the animal, holding the halter strap in the left hand while walking the animal backward.
— See that the animal is exhibited to the best advantage at all time.
— Take out the animal from the ring when the placings have been made without a word, even though the placement has not been to the liking of the exhibitor.

2. Transport of animal by rail:

— Sweep the wagon and remove the dirt and dust.
— Wash the wagon with water thoroughly and sprinkle lime and spread it with broom on the floor and on the sides to a height of 1 m of the wagon.
— Spread out bedding of at least 30 cm thickness.
— Lead the animal slowly into the wagon keeping in mind that the same number of animals are put on both sides for balancing the weight.
— Put two bamboos or casorina poles on each side in the grooves provided in the wagon.
— Arrange the fodder in the centre of the wagon, so that the animals on both sides can eat.
— Store the water in tubs for drinking en route.
— Instruct the attendants to milk the animals at regular intervals and water the animals many times.
— Take care that the wagons with animals are not loose shunted.
— Instruct the attendants not to smoke or cook in the wagon because of the danger of fire.
— Feed the animals at regular intervals.
— Let out the animals onto the ground for at least half an hour, once a day, on long journeys.

3. Transport by truck/lorry:

— Sprinkle lime on the floor of the truck
— Spread out bedding of at least 3 cm thickness.
— Take the truck to the loading ramp.
— Open the rear door on the loading ramp and cover the gap between the door and body by a plank to avoid any possible injury to the animal's legs.
— Lead the animal inside the truck gently, simultaneously pushing the animal from behind.
— Make separate partitions for individual animals with bamboo.
— The attendant should always be present on the truck when it is moving.
— Instruct the driver not to go fast, avoid sudden braking and sharp turns.

28.6 Observations

The pupil should record the following:

1. Whether all animals to be exhibited have been tested for tuberculosis and brucelosis.

Animal No.	*Tuberculosis Yes/No*	*Brucelosis Yes/No*
1		
2		
3		

2. Whether all the animals have been properly clipped, washed brushed, trimmed and trained and are free from ticks and lice.

Animal No.	*Washed Yes/No*	*Brused Yes/No*	*Trimmed Yes/No*	*Trained Yes/No*	*Ticks and Lice. Yes/No.*
1					
2					
3					
4					

28.7 Expected behavioural outcomes

Grade

The pupil will be able to:

— recall the importance of shows;
— prepare the animals for shows;
— transport the animals by rail or truck.

The teacher should evalutate the pupil for the above abilities.

QUESTIONS

1. Tick mark (√) the correct answer

(i) Grooming/trimming is necessary for removing ticks and lice.

(ii) Clipping hairs of a show cow on the head and neck/belly and udder enhances the show of milk veins on udder.

(iii) Apply coconut oil/mustard oil to the horns to give a good polish.

(iv) Polishing of halters and leading rope of a cow is essential/not essential for show purpose.

(v) Beeding thickness in a wagon for transportation of animals for a show should be atleast 1 cm/2 cm/3 cm.

(vi) Attendant can smoke/not smoke in the wagon during tranportation of animals for show purpose.

2. Fill in the blanks

(i) Give the importance of fitting dairy animals for show 1. _____; 2. _____

(ii) Why is trimming of hooves is essential for show animal 1. ___; 2. _____

(iii) Write down the purpose for which linseed cake and coconut oil is used for fitting animal for a show 1. _____; 2. _____

ACTIVITY UNIT 29

Visit to Cattle Show

9. Activity objectives

The pupil should be able to:

— recall the significance of holding cattle shows;
— get acquainted with various aspects of organizing a cattle show:
— explain the benefits of cattle shows.

29.2 Relevant information

What are cattle shows:

A cattle show is a gathering of a large number of individual specimens of animals for participation in competitions for prizes. Cattle shows are arranged to evaluate and select the best specimen(s) among the breed. Cattle shows provide an opportunity for interested people to educate themselves in scientific breeding, feeding, health cover and management of cattle. They create healthy competition among the owners, breeders and businessmen and motivate them for improvement. This helps in preserving purity and further development of the type and characteristics of a breed(s). The shows are held at various levels, viz. village, taluka, district, state, national and international level. Cattle and buffaloes of different categories participate in these shows.

How are cattle shows organized?

Cattle shows are arranged through the government, private organizations, and cooperative and associated bodies. Participating specimens are registered well in advance on the request of the owner/ breeder. They are classified into different categories, classes and groups. The organizing body confirms the registration and informs the owner in advance about participation. Necessary arrangements are made to shift the animals to the show ground.

The show environment:

Arrangements are made to provide all the facilities to the animal at the show ground. Generally, the facilities include; place for keeping the participating animal, feeds and feeding, emergency veterinary aid, watering, temporary shade, tents and required equipment. The participating animals are brought to the show ground 24 hours before the competition. The animals are allowed to rest and get accustomed to the show ground environment. The owner gives the final touches to his show animals on the day of the competition and brings the animal to the judging area. The categorical arrangement of different group of animals on the show ground is a great attraction to a large number of visitors, farmers, old people and children. Every where interested persons stand and discuss and exchange views on the participating animals. The show ground environment is fully charged with excitement and anxiety for the ranking of the animal.

29.3 Precautions

— Carefully plan the visit to a cattle show well in advance.
— Make arrangements for your stay at the place of the show.

— Obtain necessary permission well in advance from the appropriate authorities for transferring the animals.
— Carefully study the specified category or group of animals in which your animal is participating.
— Attend the judging events as learner and not merely as a visitor.
— Take a round of all animal(s) carefully without disturbing them and study their features.

29.4 Materials required

1. Notebook 2. Pen 3. Essential belongings 4. Identity card 5. Permission order 6. Visitors guide from the authorities with a plan and layout of the show place.

29.5 Procedure

— Register your animal(s) with the organizers of the show.
— Obtain permission for your visit along with your animals from the organisers
— Plan out your visit carefully.
— Be in position at least half an hour before the commencement of the show of the category in which your animals are participating.
— Witness the events and make detailed observations.
— Record your observations in your notebook and get fully acquainted with the procedure of evaluating the animals.

29.6 Observations

The pupil should record the following:

1) Participation:

Category	*Breed I*	*Breed II*	*Breed III etc.*	*Total*
i. Class : Growing stock				
ii. Class : Milch cows				
iii. Class : Bulls				
iv. Class : Dry cows				
v. Class Buffaloes				
vi. Special classes				

2) Prize Winners:

Note owners' address & special features of each prize winner.

Category	*Prize*		
	Ist	IInd	IIIrd
(i) " 1			
(ii) " 2			
(iii) " 3			
Etc.			

3) On the day of the show observe and note how:

(i) final touches are given to the animals before their entry in the screening ring;

(ii) screening is carried by experts;

(iii) animals enter the show ring;

(iv) Ganimals take rounds of the ring, displaying their gait, type, class, etc;

(v) the judges carefully examine the animals in the show ring;

(vi) the method of evaluation;

(vii) ranking of the individuals is done;

(viii) results are declared/published.

29.7 Calculation:

The pupil should calculate the following:

(i) percentage of each class of participating animals to that of total.

(ii) percentage of each category of animal to that of its class;

(iii) number of animals awarded Ist, IInd, IIIrd IV onsolation prize;

(iv) number of animals placed in championship test;

(v) percentage of animals awarded championship.

(vi) awarded show championship.

The formula for calculation is where:

$$\%A = \frac{X}{Y} \times 100$$

where:

A = percentage of class/category

X = No. of animals (entertained)

Y = Total No. of animals (show/class/category).

18.8 Expected behavioural outcomes

The pupil will be able to:

— plan out a visit to a cattle show
— perform the visit independently;
— organize the events;
— organize the show.

The teacher should evaluate the pupil for the above abilities.

Grade

QUESTIONS

1. Tick mark (✓) the correct answer

(i) Cattle shows are arranged for selling/selection/competitions of animals.
(i) Cattle shows provide on opportunitv to the farmer to educate himself/to educate the animal.
(iii) Cattle shows are held at various levels national level only.
(iv) Cattle shows in India are arranged by the government/private individual.
(v) The animals in a cattle show are arranged according to class/category/species.
(vi) The participating animals are registered in advance/at the time of show.
(vii) Show events are organized as per schedule as per convenience.
(viii) Animals are to be prepared for a show well in advance/at the time of the show.

ACTIVITY UNIT 30

Visit to a Dairy Farm

30.1 Instructional objectives

— recall the purpose of a visit to a dairy farm;
get acquainted with the components and activities of a dairy form.

30.2 Relevant information

Dairy farms are established with some specific objective(s). The objective may be production of breeding stock, commercial milk production or research. The dairy farms may be owned by the government/private individuals or organizations/associate organisations. The size of the dairy farm varies according to the herd strength and the quantum of production. Out put of a dairy farm depends on the productivity of the animals kept on the farm and efficiency of managements. There is a definite relationship between productivity of the animal and annual out turn. Dairy farms that are meant solely for production and supply of milk and milk products are run on commercial lines whereas the farms that are involved in a scientific cause emphasize research aims and achievements. Research farms are often required to maintain all the categories of animals for research purposes whereas, the commercial farms maintain only productive animals. The dairy farm may have more than one activity depending on its feasibility and importance. Commercial dairy farms are mostly situated in the vicinity of cities where there is a ready market for the produce. The military dairy farms are meant for production and supply of milk to the defence forces.

On such organized farms, all the management practices are carried out in an orderly manner according to a plan. A pupil visiting such a farm should not how all the management practices are organized and carried out. This will give him confidence to carry out such practices on his own farm.

30.3 Precautions

— Plan the details of the visit.
— Be attentive and keen in observing things during the course of the visit.
— Do not deviate from the schedule of the visit.
— Do not deviate from the schedule of the visit.

30.4 Materials required

1. A notebook
2. Pen
3. Personal belongings
4. Hand-out if available, on the farm under visit.

30.5 Procedure

— Formulate a practical plan for the visit.
— Study the salient feature of the farm from the hand-out,
— Proceed to the farm.
— Inform the farm manager of your arrival and introduce yourself to him politely.
— Seek the permission, and also ask him for a guide who can explain to you the various activities of the farm.
— Observe each and every farm activity, ask

TABLE C

Farm performance

Sr...	*Activity*	*Status*
i.	Daily milk yield	
ii.	Daily average	
iii.	No. of lactating animals	
iv.	Highest yielder	
v.	Method of milking	
vi.	Disposal of milk	
vii.	Feeds used	
viii.	Fodder used	
ix.	Per day yield of greens	

TABLE D

Costs and income of farm

Sr..	*Particular*	*Status*
i.	Labourers employed round the year	
ii.	Wages paid	
iii.	Cost of totai fodder produced/year.	
iv.	Value of feed and fodder purchased from outside.	
v.	Expenditure on miscellaneous items	
vi.	Value of total milk produced in a year.	

1.	Daily milking or wet average	= Daily milk produced (kg) / Number of cows in milk
2.	Daily herd or dry average	= Daily milk production (kg) / Total number of cows
3.	Labour hours used per day	= Number of labourers employed daily x working hours (i.e. 8 hrs)
4.	Labour hours per litre of milk produced	= Daily milk produced (litres) / Labour hours lused daily.
5.	Greens consumed per litre of milk produced	= Greens consumed per day (kg) / = Daily milk production (litres)
6.	Concentrate consumed per litre of milk produced	= Consumed concentrate per day (kg) / Daily milk production (litres)

questions freely if you do not understand anything.
— Make brief notes in your notebook on each activity while the guide explains.
— Express your thanks to the guide.
— Extend your gratitude to the authority and leave the farm.

TABLE A

Information about the farm

Sr.	*Particular*	
(i)	Name of the farm	
(ii)	Location	
(iii)	Station	
(iv)	Taluk	Distt.
(v)	Area of the farm	(a) Irrigated
		(b) Rain fed
(vi)	Strength	
(vii)	Objectives of the farm	(a) Research
		(b) Breeding
		(c) Milk Production
(viii)	Status of the farm (Govt/ Private/Coop.)	
(ix)	Name of the officer i/c of	the farm.

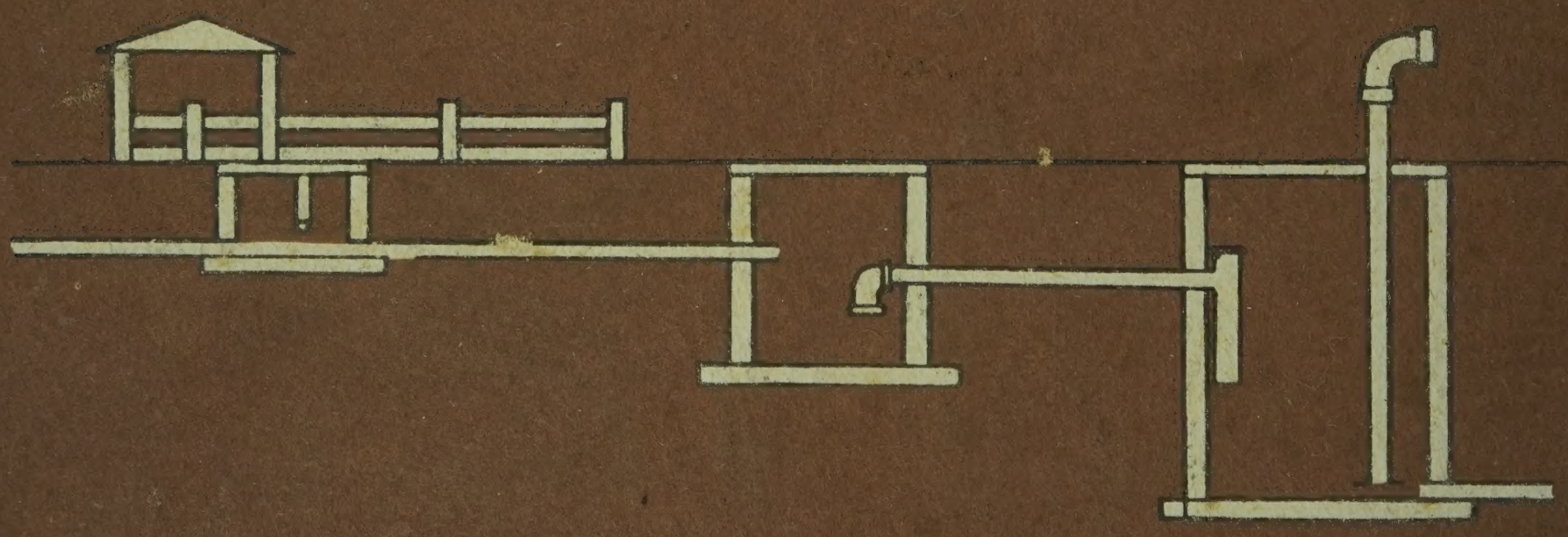
TABLE B

Broad sections of the farm

Sr..	*Section*	*Objective*
i.		
ii.		
iii.		
iv.		
v.		

Note: List here specific areas of operation like fodder production, milking and milk handling, dry cow section, etc.

जवाहरलाल नेहरू
जन्मशती

JAWAHARLAL NEHRU
CENTENARY

1889 — 1989